THE CULTIVATOR:

A MONTHLY PUBLICATION, DEVOTED TO AGRICULTURE.

I KNOW OF NO PURSUIT IN WHICH MORE REAL AND IMPORTANT SERVICES CAN BE RENDERED TO ANY COUNTRY, THAN BY IMPROVING ITS AGRICULTURE — *Wash.*

VOL. V. NO. 3, WASHINGTON-ST. ALBANY, N. Y. NOVEMBER, 1838. No. 9.

Conducted by J. BUEL, of Albany.

TERMS.—ONE DOLLAR per annum, to be paid in advance. Subscriptions to commence with a volume.

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The Cultivator is subject to common newspaper postage.

☞ Price of the published volumes, 50 cents per vol. stitched—the four volumes bound together, $2.75—bound in two volumes, $3—the four vols bound each separate, $3.25.

THE CULTIVATOR.

TO IMPROVE THE SOIL AND THE MIND.

We invite the reader's attention to our article headed *Common School Libraries*, as affording an outline of *one* of the particular objects of the society, and as exhibiting the terms of membership; and we invite our brethren of the press, to commend this matter to the notice of their readers, as one fraught with incalculable benefits to our common country.

Morus Multicaulis Speculation.

If our produce in silk is likely to increase in any thing like the increased demand for this species of the mulberry, and its rapid multiplication, we shall be able, in a few years, to clothe our entire female population in silken fabrics, and to export largely in the bargain. But the demand seems to originate from a hope of making money by speculating in the *buds*, or *trees*, rather than in the *silk* which they are to produce. Individuals have for some time been traversing the several states, from Canada to Florida, buying up these trees, and the prices have kept advancing till they have reached an extravagance beyond reason, and almost beyond credibility. The Farmers' Register informs us, that Thomas Hicks, of Virginia, laid out $345, in 1836 and 1837, for trees of the multicaulis, and that he has recently sold from their product, 20,000 trees, at 25 cents each, retaining 10,000 for his own use—thus realizing a profit of nearly $7,500 upon the outlay. In ten days, the seller might have received $1000 more for those disposed of. This was in September. In October, the fever of speculation had reached, if not its climax, at least a dangerous height to buyers: for the U. S. Gazette informs us, that at a great auction sale of these trees, at Baltimore, on the 4th inst. 120,000 of them were sold, "at prices varying from 20 to 22 cents per foot, measuring to the utmost extremity, and counting the roots also. This amounts to $1.21 for each tree of five feet high." At a sale at Germantown the prices exceeded 20 cents per foot. At Burlington, N. J. a sale of 2430 was made by Mr. Greenmere, for $2500, and another of 1000 selected trees for $2000, being two dollars each. If this is not a "*Robin's alive*" business, in which some one will get sorely "*saddle-backed*," we are greatly mistaken.

There is no tree more rapidly multiplied, probably, than the morus multicaulis. Every uninjured bud will produce a plant in a summer. The practice is, among proficients in the art of propagating, to take off every branch and the top, or to take up the entire young plants, in the autumn—to bury them in the ground, or put them in a cellar during winter, and to plant them in the spring, either in cuttings of one or two eyes, or by covering the branch or young plant, laid horizontally in a furrow, with an inch or two of earth. Almost every bud will grow from two to four feet the first season, and ultimately become a tree. This will explain to the reader, why select trees, abounding in branches and buds, sold for two dollars at Burlington. They were cheap, *if* the prices can be kept up another year.

In regard to the culture of this mulberry in our latitude, we have only to repeat the opinion we have often expressed, that the *tree* will not stand our winters, except, perhaps, upon a poor dry soil, when the growth ceases, and the wood hardens, before the occurrence of severe frosts. Indeed this is now virtually conceded by the growers; for we believe it is the general practice to secure seedlings in the cellar, or to bury them in the ground, and to cut down the trees, cover the stumps, and secure the tops and branches for propagation. Cutting down at autumn is recommended as the best mode of increasing the foliage, and as facilitating the gathering of the leaves—as many sprouts spring from the stump in the spring, and the leaves of which may be gathered without climbing.

That the silk business will ultimately prosper among us, we have no doubt; but that the multicaulis is to supersede all other species of the mulberry, or that it possesses very remarkable properties not common to the family, we must be permitted to entertain doubts. Gen. Tallmadge, who visited the silk establishments of Italy, and was minute in his inquiries, tells us that the European black mulberry had a preference there. In France the white mulberry, it is alleged, produces the best silk. We have seen beautiful fabrics from our native red species. While those who have seen, at Constantinople, the silks produced from the Brussa, affirm that they exceed all others for lusture and value. Men are prone to recommend that which they wish to sell. In our mind, it matters little what species of mulberry we cultivate, provided it is hardy enough for the climate. If any kind is well managed *by household industry*, they will, in our opinion, become a certain source of profit to the owner.

Experiment in Harvesting Corn.

In our last November No. we gave the result of an experiment in harvesting corn, going to show, that it is better to cut it up than to top it. We now give the result of another experiment of the same kind.

In the first week of September, we went with two neighbors into our cornfield, where our men were cutting up corn, and caused 36 hills to be cut up, where we found them at work, which was of the fair average quality of the field, and stooked separately; adjoining which 36 hills were topped, in the usual way; and a third parcel of 36 hills, immediately adjoining the last, was left to ripen upon the entire stock. On the 23d September we proceeded to pick, husk and weigh the corn on the several parcels. The result was as follows:

No. 1, cut up, had 126 ears, which weighed 56½ lbs.
No. 2, topped, " 127 " " 52 lbs. 2 oz.
No. 3, standing, " 125 " " 52 lbs. 10 oz.

We found on trial, the same evening, that it required 78 lbs. of ears to give a bushel of shelled corn. The field was planted at exactly three feet between the rows, and at about two feet four inches in the rows; but assuming that the distance was three by two and a half feet, it would give to the acre 5,808 hills—and there probably was not 20 hills deficient in five acres. Upon these data the product on an acre, under the different modes of harvesting, would be as follows, omitting fractions:

No. 1 would give	9,274 lbs.	or	119 bushels.
No. 2 "	8,409½ "		108 "
No. 3 "	8,490 "		109 "

Although the parcels selected were supposed to be similar, it was perceived, after the corn was gathered, that an apple tree, giving a shade 6 to 7 feet broad, stood in No. 3—the whole field being a young orchard—which undoubtedly had an influence in lessening the product of that parcel—as it might reasonably have been expected to have exceeded that of No. 1.

In regard to the condition of the grain, of the different parcels, that of No. 1, which had been cut up and stooked, was unquestionably best: it was dry, sound and bright; while much of Nos. 2 and 3, which had been topped, or left standing entire, had fallen upon the ground, was wet or mouldy, and some of it had actually grown. The difference in the fodder was still more palpably in favor of No. 1—it evidently exceeding in value either of the other parcels more than one half.

Our neighbors, C. N. Bement and Sidney Chapin, were present, and assisted, in the cutting up, topping, picking, husking, weighing and examining, the several parcels, and have authorized us to say that they fully concur in the preceding statement.

In our experiment of last year, the loss in topping, over cutting up, was found to be about six bushels; in the above detailed experiment it appears to be eleven bushels on the acre. It will also be observed, on referring to our former experiment, that the number of ears, and the product, is less this than it was last year. This has been caused by the drought. None of the succors produced ears this year, though many produced them last year.

This experiment confirms us in the opinion we have long entertained, that there is a prodigious waste, both in corn and forage, and we insist in labor also, in the still common practice of topping corn. And we again beg, that those who remain incredulous in the matter, will make the experiment, as we have repeatedly done, and satisfy themselves. Say there are 300,000 acres of corn cultivated in this state, and that the loss by topping is only five bushels to the acre, the aggregate loss would amount to 1,500,000 bushels, equal at least in value to one million of dollars annually, to say nothing of the loss in labor and forage.

The *cause* of the topped corn having produced less than that which was cut up, although often stated, is here repeated: the topped corn was deprived of its elaborating organs—its lungs—the leaves above the grain, and of course received no farther accession of growth, or but very little; while the corn cut up retained these organs, which continued to send down nourishment to the grain for some days through its green succulent stocks. Any farmer may satisfy himself readily that leaves are indispensable to growth, by a simple and easy experiment:—let him pluck all the leaves from a fruit-bearing branch of the apple, plum, or other fruit tree, at any stage of growth of the fruit—and he will find that the fruit on such limb will neither grow nor mature its flavor where there are no leaves—though it may change its colour.

Rohan Potato.

A few tubers of this potato were introduced from France, in 1836. We have cultivated them two seasons, and feel justified in recommending them as a valuable acquisition in our husbandry—

First, because their quality, for the table, will justify it. If not superior, they are good. The flesh is yellow, solid, and of good flavor.

Secondly—because they admit of a great economy in seed—two eyes sufficing (and many of the tubers have thirty to forty eyes,) to plant a hill, and three or four bushels to plant an acre of ground.

Thirdly—because they require comparatively little labor in harvesting—a man being able to dig thrice as many of them in a day as of ordinary kinds. The tubers are very large, one hundred and ten, of the largest of our crop, completely filling a flour barrel. Twenty seven bushels were dug in our presence in one hour, the tops being pulled, by one man, at moderate labor.

Fourthly—because they yield an abundant crop. From 85 rods of ground we gathered 175 bushels, while our common cultivated kinds did not give us half a crop. One case has been stated to us, of a single potato producing a bushel, and another of its having produced a barrel, at harvest.

This potato sends out laterals from the main stem, which grow to great length; and the roots which feed it, strike deep, are numerous and strong. Hence the ground in which they are to be planted, should be ploughed deep, and the hills should be placed widely apart, that the soil may acquire solar heat. We ought further to remark, that they should be planted early in our climate, as early as the ground is sufficiently warmed for their reception, as they seem to require the whole season to grow their large tubers and mature the crop.

The principal growers of this potato, we believe, are J. A. Thompson, Esq. of Catskill, who was one of the first to introduce them into our country, and C. N. Bement. It may supersede inquiry to state also, that the price at which the growers hold them, is $9 the barrel, or $3 the bushel. Our crop has been disposed of. They are sold by the Messrs. Thorburns, at Albany and New-York.

The product of this potato, with Mr. Harger, (see correspondence) was 144 lbs. for 13 ounces of seed planted; and we are informed by a gentleman from New-Haven, that some of his tubers were sold at the horticultural fair in that city at one dollar each!

Agricultural Societies.

A new agricultural society has been recently formed in the north part of Otsego, which held its first exhibition at Cherry Valley, on the 17th inst. An address was delivered on the occasion by Mr. Senator Beardsley. The exhibition of farm stock, we understand, was uncommonly fine, and embraced choice animals of the improved breeds of neat cattle, sheep and swine, which occupied seventy pens, besides many bulls, and other animals that were tied to posts, &c. Otsego is destined to be one of our best districts for cattle and sheep husbandry; and perhaps no county can even now boast of more fine animals, than have been imported, collected and raised by her enterprising breeders. A society already existed at Butternuts and its vicintity.

The *Fulton County Agricultural Society* was organized, at Johnstown, on the 18th October. This county is also well adapted to cattle and sheep husbandry, and some fine animals have been already introduced there. The dairy business is particularly engaging the attention of the western towns. Great quantities of butter and cheese are annually produced; the business is extending, and makes liberal returns to those engaged in it. The southern border of this county, particularly the district about Johnstown, has long been celebrated for its fertility. It is well calculated for alternate and mixed husbandry. The new society, if conducted upon liberal and wise principles, with a view to enlighten, stimulate and benefit all, will not fail to produce highly beneficial effects.—The products, in the glove and mitten business, are stated to amount in value to a quarter million dollars annually, in that county.

The *English Agricultural Society*—a national institution—was organized in London in June, under Earl Spencer as president, twelve trustees and eleven vice-presidents, all belonging to the nobility or to parliament. We mention this latter circumstance merely to show, that the first men in the British empire are the ardent active advocates of agricultural improvement; and are devoting their time and means to its advancement;—and in the hope, too, that their example may have a benign influence upon the great men of our country, in inducing them to become active and liberal promoters of improvement in this great branch of national industry, and primary source of national wealth. They may be assured that they can hardly render, in any other way, a more enduring service to their country, or to its civil institutions.

Among the avowed objects of this society, are the following, which we copy for the particular information of our statesmen, and for the benefit of our readers generally, as indicating some of the prominent means of improvement. These objects are,

"1. To embody such information contained in agricultural publications, and in other scientific works, as has been proved by practical experience to be useful to the cultivators of the soil.

"2. To correspond with agricultural, horticultural, and other scientific societies, at home and abroad, and to select from such correspondence, all information which, according to the opinion of the society, is likely to lead to practical benefit in the cultivation of the soil.

"3. To repay any occupier of land, or other person who shall undertake, at the request of the society, to try any experiment how far such information leads to useful results in practice, any loss that he may incur by so doing.

"4. To encourage men of science in the improvement of agricultural implements, the construction of farm buildings and cottages, the application of chemistry to the general purposes of agriculture, the destruction of insects injurious to vegetable life, and the eradication of weeds.

"5. To promote the discovery of new varieties of grain, and other vegetables useful to man, or for the food of domestic animals.

"6. To collect information with regard to the management of woods, plantations and fences, and on every other subject connected with rural improvement.

"7. *To take measures to improve the education of those who depend upon the cultivation of the soil for their support.**

"8. To take measures for improving the veterinary art, as applied to cattle, sheep and pigs.

"9. By the distribution of prizes, and by other means, to encourage the best mode of farm cultivation, and the breeds of live stock."

Among the rules of the society, it is declared to be a fundamental one, that no questions of a political tendency shall be discussed at its meetings.

Among the prizes for essays, is one of 50 sovereigns=to $220 "for the best account of the improvements which have taken place in the agriculture of Scotland since the formation of the Highland Society."

Premiums of ten and twenty sovereigns are also offered for the best essays, verified by practice, upon the following subjects:

"1. Best mode of keeping roots;
2. Subsoil or trench ploughing;
3. Transposition and admixture of soils;
4. Insects prejudicial to plants;
5. The black caterpillar which destroys turnips;
6. Application of mechanical power;
7. Two horse ploughs;
8. Spring food—corn—grasses—vetches;
9. Rotation of crops;
10. Best mode of analyzing soils;
11. Irrigation;
12. Plantations;
13. Underwood;
14. Varieties of grain:
15 Economical keep of farm horses;
16. Improved rural economy abroad;
17. Stall feeding on the continent;
18. On the diseases of plants."

This society embraces 186 governors, that is, subscribers who pay £5, equal to $22.20, annually.

All of these matters, it will be readily seen, have a strong bearing upon improvement in agriculture,—they aim at substantial and permanent improvement—and will afford useful suggestions, to our agricultural societies, in the bestowment of their awards.

* We would add, as applicable to our own condition—"*and upon whom the state must ever depend for the perpetuity of its civil and religious freedom.*"

Agricultural Chemistry.

The importance of this science to profitable farming, becomes particularly apparent, where mineral, bone and other manures are employed. At the organization of the English Agricultural Society, in June, this matter was particularly alluded to by J. Bennet, Esq. M. P. "It was well known," he said, "that on some lands lime was useful, whilst on others it was detrimental; bones were advantageously employed on one class of lands, and were hurtful on others; and other chemical manures which were applied on some soils were injurious to others. The adaptation of manures to soils [and to crops] was very important, and could not be better illustrated than by the plan proposed [indicating, by different colours, upon geological maps, the different compositions of soil.] He hoped the society would be in possession of a chemical apparatus, with an able chemist that might be able to analyze the soils which might be sent them, and point out these adaptations. Artificial manures were becoming of more importance, and he doubted not they would continue more to flourish and be adopted. There was a necessity that every science connected with agriculture should be more fully developed, and this development would be effectually accomplished through the medium of the society."

We have vast resources of fertility in our lime, gypsum, ashes, peat earth, poudrette, bones, salt, &c. but the great difficulty is, we do not know where to apply them, from not possessing a chemical knowledge of our soils; and the frequent failures which happen from misapplication, prevent their being applied in a thousand cases where they would produce the best effects. What wonders have been wrought, in the woollen and cotton business, in a few years, by the aids of chemical science! And is there not a strong probability that as great benefits may yet result to agriculture from this wonder-working science?

Let us not be misapprehended: we mean chemistry in the *field*—not in the *closet*—practically tested and illustrated on the *farm*, by its teachers—and not alone in the *laboratory*. The one is mere theory—the other theory confirmed and rendered certain by practice. In the manufacturing arts, it is the chemist himself who applies the science to the art—who teaches the *application*, as well as the *principles* of science—the *hands* as well as the *head* of the pupil. And it must be so, we apprehend, in agriculture, before we can expect to derive great benefits from its aid. It is to *schools* which combine the science and practice, where the principles can be demonstrated and taught in the field, and by men specially devoted to the improvement of our husbandry, that we must look for the important aids which chemistry is capable, and we believe destined, to give to the parent art.

The philosopher may build up theories, and establish principles, which he may deem beneficial to husbandry,—and others may implicitly adopt his opinions—and neither of them may ever test them upon the broad theatre where they are intended to operate—and yet, on trial they may prove illusory and unsound. The theory of Tennant, that magnesian lime is prejudicial in agriculture, is a notable instance of error being thus perpetuated. His opinion has been implicitly adopted by most of the subsequent writers upon this subject; and, if it has not done much mischief, it has certainly prevented much good. The limestones of Pennslyvania abound in magnesia, and yet they have been found highly beneficial to her agriculture. And we have before us, in the Farmers' Magazine, a palpable disproof of the correctness of Tennant's hypothesis. The writer of the article alluded to has been in the constant use of the very magnesian lime, in Leicestershire, which Tennant had pronounced hurtful to agriculture, and has applied it, in some cases, to the extent of 400 bushels to the acre, and with encouraging success. The prejudice excited against this lime by the chemist, had prevented the farmers, at whose doors it lay, from using it; and they had been in the habit of obtaining their lime from a distance at considerable expense, till Tennant's theory became exploded by the demonstrative practice of the writer. We repeat, that we fear agriculture will not profit, as it may and ought to do, from chemical science, until it is coupled, in schools of instruction, with the practical application of its principles to the soil.

Agricultural Improvement.

The best way to show what *can* be done, is to show what *has* been done—and the strongest incentives to improvement are the comforts and enjoyments which they confer. Individual illustrations, both of improvements in husbandry, and of the blessings they bring in their train, are to be found in almost every district, but the lesson becomes more useful and impressive when we can extend it to a district of country. A case of this kind is recorded in the Farmers' Magazine for August. It is a contrast of the rural condition of Ayrshire, a district of Scotland, in 1793 and in 1838. At the former period, its husbandry was in the most wretched state, as bad as our worst managed districts—now it is one of the best managed and most productive in Great Britain. All this change has been effected in less than fifty years. We copy it in the hope that its perusal will do good, by stimulating our readers in the work of improvement.

"Col. Fullarton drew, in 1793, a most deplorable picture of the wretchedness, ignorance and apathy in which the farmers were sunk, up to the middle of the last century. The land was neither cleaned nor drained. Four horses were now and then yoked to the clumsy old fashioned plough, and frequently three horses with drivers. When the plough was drawn with a pair of horses, it always required two men to manage it—one man to hold the plough, the other to drive the horses. But what a contrast does the present state of this country afford to the miserable condition of farming in Ayreshire, during the last century? Fields, in many places, completely tile drained, and subsoil ploughed,—in others, similar improvements going forward—large tile-kilns erected upon nearly every estate, to promote drainage and productiveness of agriculture—good fences, chiefly of quick-set thorns—ploughs of the best construction, drawn by active, well bred, and fed horses, and guided by skilful ploughmen—agricultural societies to collect together those engaged in farming pursuits—to reward merit—to diffuse useful knowledge, on all matters connected with rural economy: and, above all, an intelligent local press, to glean from all quarters, for circulation, what is worthy the attention of the farmer to know, how to improve the management of his farm—comfortable neat farm buildings, and other conveniences—the finest breed of dairy cows in their island. These particulars—these important alterations and improvement,- mark out Ayrshire in 1838, as mightily advanced in the high scale of agriculture, since Col. Fullarton described it in 1793."

The Robinson Fund.

The Editor of the Franklin Farmer, B. Stevens, offers one hundred dollars,—and the publisher of the same paper, Fred. Pettit, one hundred dollars, to the *Robinson Fund*, to be awarded as premiums to the writers of the best agricultural school books. See Mr. Robinson's propositions in our October number. So the fund now consists of eight lots of land, whose assessed value is $440—and $320 from the establishments of the Franklin Farmer and Cultivator—Total, $760. Who will direct us to add his name to the list of contributors, and for what amount?

Governmental Patronage to Agriculture.

The (London) Farmers' Magazine, for August, gives, as its leading article, and with commendatory remarks, the outlines of the bill reported by our friend Allen, in our last House of Assembly, "to encourage agriculture." There is only one mistake about the matter. That journal states that the bill had become a *law*—when the fact is, it not only did *not* become a law—but its provisions were not even discussed—except by one house, an hour or two, in evening sessions. We hope the next legislature will amend the record, and endorse *passed* upon what the London editor considers already so.

The Turnip Fly,

Has been uncommonly destructive this year to the ruta baga crop. It seems now to be confidently affirmed, in some of the European agricultural journals, that sulphur, or brimestone, may be effectually employed as a preventive. One mode of using it is, slightly to moisten the seed and roll it in sulphur, previous to sowing. The other, to keep the seed for some time in sulphur, and to sow the sulphur with the seed. It is affirmed, that the young plants in this way become so strongly impregnated with the sulphur, that the fly will not touch them. Sulphur is so extremely subtile, that it is known to diffuse itself, in a very short time, through the vegetable, as well as the animal system; and it is known to be obnoxious or destructive to the whole race of insects. The turnip seed imbibes it, and imparts it, with the sap, to the young plumule, or stem. Although the prescription is now out of season, it should be laid by for trial at the sowing season.

A Great Sale of Imported Durham Short Horns,

Is advertised to take place at Powelton, near Philadelphia, on the 5th Nov. The cattle are of the stock of Mr. Whitaker, one of the most eminent breeders in Britain.

The American Society for the Diffusion of Useful Knowledge,

Was organized in October, 1836, and now comprises, we believe, gentlemen in every state, distinguished for literature, science and public usefulness. Its objects, as its title purports, is the diffusion of useful knowledge among the great body of the American people, in the cheapest, purest and most efficient form. Such an object is worthy of the philanthropist and the patriot. It is in consonance with our highest duties as men, and as *free* men. It invokes the best feelings of our nature, and promises, in its results, the enlargement of individual enjoyment, (for *self*, some how or other, will always be the prompting motive to action,) BY PROMOTING THE PROSPERITY AND HAPPINESS OF ALL AROUND US.

This society seems modelled on the plan of a similar one in Great-Britain, of which Chancellor Brougham is the distinguished head, and which has been eminently useful, not only to the country where it exists, but to the civilized world, in the publications which it has issued from the press, relating to all the useful branches of knowledge, and which have had a circulation unprecedented in the annals of printing. It is by carefully selecting for the press, that public taste and public morals are improved, and general improvement promoted. It is by means of heavy editions, that works of merit are afforded at a third or a quarter of the ordinary cost, and that they consequently obtain a more general circulation, and a more benign influence upon national manners and character. We are indebted to the British society for a knowledge of many of the improvements of the day, in science and in the arts of labor. The farmer is indebted to them for the many valuable extracts, which appear in our agricultural journals, from their "Farmers' Series," on the various branches of husbandry; and all classes of readers are indebted to them for their Libraries of Useful and Entertaining Knowledge, Journal of Education, maps, treatises on Political Economy—for their Penny Magazine, Encyclopædia, &c. Their labors have produced a new era in intellectual improvement. The American Society, if properly supported by our citizens, cannot fail of doing infinite good to our country, and of conferring lasting benefits upon posterity.

Common School Libraries.

We insert to-day, a communication from "*A Westchester Farmer*," in answer to our remarks in the August No. of the Cultivator, on the subject of common school libraries. Although it does not alter our opinion as to the books which ought to constitute the *basis* of a common school, or rural library, it serves to explain why works upon rural affairs have not formed a larger portion of the first class, which has been recommended to the districts.

From the documents accompanying the communication, we find that it is in contemplation, to publish a series of volumes upon agriculture—to consist of treatises "on the nature and properties of soils; the products of the vegetable kingdom, the culture and use of all trees, plants and vegetables, usually cultivated for use or profit; on the history, nature and management of the different domestic animals and their productions; in short, on all subjects connected with the pursuits of husbandry, designed to furnish the sons of the farmer, in a country destined to such high agricultural interests as ours, the best facilities for acquiring all necessary and desirable knowledge connected with their employments, their interests and their happiness." And the synopsis of the contemplated library embraces the following enumerated subjects which relate to husbandry: Soil, its varieties and culture; the vegetable kingdom; timber and wood; vegetables for the food of man; do. of animals; orcharding; horticulture; vegetable physiology; chemical functions of vegetables; management of live stock; the horse, cattle, sheep, poultry; the honey bee and silk-worm; animal mechanics; chemical functions of animals; agricultural economy; household economy and the dairy.

These works upon agriculture, together with others which are promised upon the arts, and upon physical, intellectual, moral and political science, will, when the whole is completed, form an invaluable library, which cannot fail of producing, in a few years, the most benign effects, upon the industrial, moral and social habits of every school district into which it shall be introduced.

Under the view of the subject which these facts present, we feel no hesitation in expressing a hope, that every school district will avail itself of the opportunity which now presents, of laying the foundation of a work of usefulness, which, after benefiting the present generation, cannot fail of imparting lasting advantages to posterity. The books now published consist of 50 vols. averaging 250 pages each, of uniform size and binding, boxed in sets, the box serving as a book case, with lock and key —and the whole may be purchased, including the book case, at *twenty dollars*.

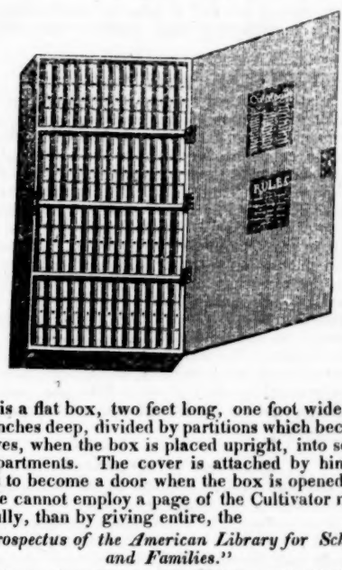
The 4th section of the act of last session, "to appropriate the income of the United States deposite fund to the purposes of education and the diffusion of knowledge," is as follows:

"The sum of fifty-five thousand dollars shall at the same time be annually distributed to the support of common schools, in like manner and upon like conditions as the school moneys are now or shall hereafter be distributed, *except that the trustees of the several districts* SHALL appropriate the sum received TO THE PURCHASE OF A DISTRICT LIBRARY, *for the term of three years*; and after that time for a library, or for the payment of teachers' wages, in the discretion of the inhabitants of the districts."

The law is therefore mandatory upon the school districts, for three years, provided the districts raise an equal sum for this purpose. After three years it is left discretionary with the districts whether the amount shall be applied to make additions to a library, or to the payment of teachers' wages. The proportion of this appropriation to each district will be about half the amount received last year from the common school fund.

FORM OF THE BOOK CASE.

[Fig. No. 55.]



It is a flat box, two feet long, one foot wide and six inches deep, divided by partitions which become shelves, when the box is placed upright, into seven compartments. The cover is attached by hinges, so as to become a door when the box is opened.

We cannot employ a page of the Cultivator more usefully, than by giving entire, the

"*Prospectus of the American Library for Schools and Families.*"

"The American Society for the Diffusion of Useful Knowledge proposed from the commencement, to devote very early attention to the publication of a series of works, on the more important branches of popular knowledge, to be prepared and issued in a style and manner, suited to the purposes of a School Library. The primary object was, to have them placed as extensively as possible, in the common schools of the country, that they may be loaned to the children, and circulated through them among all the families of the districts. Some of the considerations which have led the society to attach special importance to this plan, are the following:

"1. The social, circulating library is unquestionably the most economical and efficient mode of supplying the means of knowledge, to the large mass of young persons between the ages of ten and twenty, in the common school districts, throughout the country, now almost wholly unprovided with books of general information.

"2. This class of persons are at a period of life, in which the means of knowledge are of the highest interest and value. In youth, the powers of the mind are all in active exercise. Curiosity is awake; memory is faithful; the attention, not yet distracted by the engrossing cares of active life, gives itself wholly to its work. There is an ardor in the thirst for knowledge, which shows itself in the intense eagerness to *hear* and *know*; and many would seek constant gratification from books, if books could be obtained, of a character adapted to their taste and age. This period is the best time in life, for storing the mind with knowledge, and almost the only time to acquire a *taste* for its attainment in future years.

"3. Such a library will be the means of great advantage and improvement to the schools with which they are connected. It will, in fact, add a new department to the system of education, the influence of which will extend to the whole population. It will concentrate interest in the schools, enlarge the sphere of the teacher's instruction and influence, elevate his employment and office, connecting pleasant associations with it in the minds of the scholars and in the families to which they belong. It will raise the tone of literary interest and ambition among pupils, and relieve the dull routine of mere elementary instruction, by the pleasures of entertaining and useful knowledge. It will be a kind of connecting link, to unite the school with society around, and will naturally form the nucleus of an extended popular library, which by subsequent yearly additions will contain the materials for a general acquaintance with all subjects of interest and benefit to the community.

"4. It seems necessary, in order to carry out and complete the work of school education, to provide some such supply of the means of reading. The elementary branches taught in the classes, are rather the instruments by which knowledge is to be acquired, than the acquisition itself. They constitute the preliminary training of the mind, and when this is in some good degree accomplished, how important that the pupil should have opportunity to employ his powers, in exploring the field of knowledge. The school teaches the boy to read; and gives him some elementary knowledge of various kinds which enables him to understand books. When this is acquired, we must give him the books, or our work is incomplete.

"5. Such a library of simple, interesting and instructive works, would exert a vast influence in preserving the morals of the community. An entertaining book is one of the strongest keepers a child can have. Its chain is invisible, and it neither chafes nor annoys the wearer. But it is more effectual than almost any other restraint. How many hours would such libraries rescue from idleness; from wicked conversation; from open dissipation and vice? how many from noisy brawls and savage fights? And this, too, just in the most important crisis; for, if a young man's character is saved till he is twenty-one, it is in general saved for life. This plan also, by providing a source of enjoyment and improvement for all the members of a family *at home*, will strengthen the domestic relations and tend to revive and restore the love of domestic pursuits and pleasures. The experience of ages shows that mankind can exist safely and in happiness, only in the form of a vast congeries of *families*; and the more we can strengthen the *love of home*, and bring means of improvement and happiness to every man's fireside, and keep the inmates of the household at home, the better for the virtue and solid happiness of the community.

"6. It will be a very effectual mode of supplying the population generally with the means of knowledge. Through the scholars, the books will find their way, in constant rotation, to all the families around; and many circumstances will conspire to cause them to be extensively read, by the adult population. Parents are always specially interested in their childrens' pursuits, and often like to read themselves what their children are reading. And the interesting nature of the subjects, the simplicity and directness of the style, and the practical utility which will every where be aimed at, will fit these works peculiarly to the wants of a large class of our population too much engrossed with cares, or wearied with the toils of life, or of too little mental cultivation to engage in more extended studies.

"7. The plan is a very economical one. The amount of useful result is very large, when compared with the expenditure. A book sold to an individual is commonly read but by few, and is then laid aside idle and useless. These books, on the contrary, will circulate continually, and be used by new readers in succession, till worn out. An edition of 1000 copies, in the ordinary way, will reach perhaps 5,000 or 10,000 minds. But on this plan, circulating among the families of a thousand districts, they will have opportunity to reach *several hundred thousand minds*. Indeed, if it were desired to make known a narrative of facts, as extensively as possible to the mass of a community, what cheaper or better mode could be devised, than to place a copy in every school to be loaned to the scholars in rotation? A sum not exceeding the ordinary endowment of a professorship in one of our colleges, will found such a national library; and enable the society to perpetuate its blessings indefinitely among the *rising generation* in our country. Tens of thousands, in our day, hundreds of thousands, millions, yet unborn,—would have their minds expanded, and their characters formed, under its benignant influence. Such a library placed in every school in our country, would seem to be one of the most effectual and desirable measures for the general diffusion of knowledge and the improvement of society, that could possibly be devised. Its benefits would be incalculable. It seems to the committee, that if the founders of such libraries as the Bodleian, the Harleian, and the Cottonian in England, had devoted one-half their munificent endowments in establishing a suitable library for the common people, with the means of giving it universal circulation among the towns and villages of our mother country, they would have accomplished incomparably more for the improvement and happiness of their countrymen and of the human race, than they have now done, by their princely gifts in the republic of letters.

"And they cannot but express the hope that the immense importance of such a benefaction may attract the attention of the opulent in our country, and that patriotic individuals may be found willing to give their influence and a portion of their property to the great work of diffusing among all classes of their countrymen, and through many future generations, the elements of a sound and wholesome literature."

"EXECUTION OF THE PLAN.

"All the arrangements for carrying the design into execution, are in a state of forwardness, so far as they can be, before the necessary funds are secured. It is estimated that $15,000 are required to manufacture the stereotype plates for 50 vols. If this sum were furnished, the library would be at once completely and permanently endowed, as arrangements can be made with publishers, if the plates are furnished, to supply the market fully and constantly, and defray all the expenses of manufacture and copyright out of the proceeds of the sales. Should, therefore, any benevolent individual, or the community, place in the hands of the society the means to procure these plates, the perpetual supply of the books, at the cost of $20 for the fifty volumes with their case, would be at once secured.

"The society take the liberty, therefore, to lay these suggestions before the community, and they solicit from any individuals who may be interested in the subject, a reply to this communication, offering either suggestions in respect to the general interests of the plan, or proposals for furnishing particular books, or aid in raising the necessary funds.

"By the constitution of the society, the annual payment of $5, or more, constitutes an individual a member; of $100, within any one year, a life member; of $500, a life director; and of $1000, within the same period, a life director and an honorary member of the executive committee. Members of the society are also to be entitled to the privilege of purchasing publications at a reduced price; life members and life directors will be entitled to receive five per cent annually, on the amount of their payments in publications, if applied for within the year.

"Any individuals disposed, in either of the above ways, to aid the objects of the institution, are earnestly and respectfully solicited to do so, as soon as may be, through the treasurer, A. P. Halsey, Esq. cashier of the New-York Bank, to whom all communications relative to financial concerns, may be addressed.

"Any school or family, any lyceum or other institution dis-

posed to subscribe for the library, or any individuals willing to undertake to supply the schools in a town or county, are requested to signify the same to the committee, and the number of copies desired.

"Editors of newspapers and other periodicals, friendly to the interests of education and the universal diffusion of knowledge, are respectfully requested to give this prospectus an insertion, and to co-operate with the committee in bringing this important object before the community, and securing its accomplishment.

"In behalf of the executive committee,

"LEONARD BACON,
"THOMAS COCK,
"TIMOTHY R. GREEN,
} Sub Committee.

"GORHAM D. ABBOTT, Secretary.

"*New-York, Oct. 12th, 1837.*"

Why is it best to bury Manure?

Animal matters decompose with facility when acted upon by moisture and air, the greater proportion of their elementary parts making their escape in various forms of combination, and leaving the earths, alkalies and carbonaceous matters remaining.

When this decomposition takes place beneath the surface of the ground, these gaseous compounds, as well as the carbon (which there is reason to believe assumes also the gaseous state by combining with oxygen,) may be supposed to be partially or wholly retained in the earth, to afford the matter of nutrition to the plants.

Purely animal substances, therefore, which thus readily decompose, do not absolutely require fermentation before they are mixed with the soil.

Vegetable fibre is, under certain circumstances, a slowly decomposing substance. When vegetables are green and full of juices [as all green crops and grass leys] they readily ferment; [hence the impropriety of wasting these fertilizing properties by cross-ploughing] but when the stems are dried, as in the case of straw and litter, they decompose with slowness, and the mixing them with animal matter hastens the putrefactive fermentation.

The principal animal matters which are mixed with the ligneous fibre of the litter, and which cause it to undergo decomposition, are the dung and the urine of the animals.—*Prof. Low.*

The practical lessons to be drawn from the above theory, are, 1. To make your cattle yards concave, or hollow in the middle, to retain the urine of animals, nearly the moiety of the manure. 2. To strew or feed your straw, stalks and other litter in the yard, to absorb the urine and other liquids there accumulating. 3. To apply this manure before it has undergone much fermentation, that the soil may inhale its gaseous portions. And we would add, 4. To apply it to a hoed crop, that the weeds and grasses, the seeds of which are blended with the dung, may be extirpated in the process of after culture.

Composts,

Are useful in two cases—1. To save fertilizing matters, which might otherwise be wasted or lost; as the urine of cattle, or the gaseous matters which are evolved from a dung heap undergoing fermentation. And secondly, to render soluble, and available as the food of plants, that which is not already so, as swamp earth, woody fibre, &c. But there is nothing *added* to the elements of fertility by mixing vegetable, animal and mineral matters in a compost heap. On the contrary, lime is known to be decidedly prejudicial when mixed with yard dung, and by some is thought to be so when mixed with peat earth, by forming with them new combinations that are insoluble.

Agricultural Exhibitions.

The agricultural journals which reach us abound in accounts of the cattle shows and agricultural fairs, which were generally held in October, from Maine to Kentucky. At the Kennebeck show, 3,000 persons are said to have been present, and 150 yoke of oxen, besides a corresponding number of other animals, were exhibited. Premiums were awarded upon a drill barrow and a root cutter, of recent invention, and upon apples, pears and other fruits. In Scott county, 26 silver cups were awarded;—in Lincoln 28, and in Woodford 35, all in Kentucky—as agricultural premiums.

The Weights of Grain,

Are materially influenced by climate, and are generally heavier in a northern latitude, or in an elevated district, than they are in a southern latitude, or in a low district. The cause of the difference we believe to be this—that in the former the heat is more moderate, and the grain is consequently longer in maturing, and acquires greater bulk and solidity. The like difference is also often found to exist, in some species, between that grown on cold heavy land, and on land which is light and warm. Disappointments often occur, in sowing heavy seed, from a northern or elevated district, in not realizing a corresponding weight in the product. These facts are in a measure corroborated by the following exhibit of the weight of grains for which premiums were awarded, on the 2d Oct. by the agricultural society of Bathurst district, Upper Canada, a memorandum of which has been sent us by H. C. Baker.

Fall wheat,	64 lbs.	2	oz.	per	Westminster bushel.
Spring do	63 "	8	"		"
Common oats,	44 "	8	"		"
Potato oats,	46 "	6	"		"
Peas,	66 "	6	"		"
Barley,	54 "	14	"		"
Indian corn,	64 "	2	"		"

Highland Society.

The Highland Society of Scotland is about to institute a museum on a large scale. For several years the directors have been gathering together materials for a museum, and it appears the collection they have formed is now sufficiently extensive to justify the erection of a handsome building especially designed to contain it. It will contain models of all known agricultural implements, seeds, &c. with models of different varieties of stock of the most approved breeds. The society's first premium to have been awarded in Oct. was 500 guineas, for the application of steam to the cultivation of the soil; and gold and silver medals for reports of improved rural economy abroad, particularly in France, Germany and the Low Countries; and the society propose to take the earliest opportunity of communicating their details to the public.—*Herald.*

Profit of Agricultural Improvement.

In a late statistical account of Scotland, we have a striking illustration of the benefits of outlay in improvement, in the example of a Mr. Maxwell. In 1828, he commenced operations on a farm of 550 Scotch acres, on a great part of which it was difficult for the plough to enter sufficiently deep into the soil, because obstructed by stones imbedded, especially on the top of the subsoil. These lands were not then worth, in grass, more than 10s. an acre. At the date of the publication he had perfectly reclaimed 235 acres, by removing all the stones, to the depth of from 12 to 15 inches, and by making from 8,000 to 10,000 rods of drains. The whole expenditure amounted to nearly £5,000, or $22,200—less than $20 an acre. The five first crops taken from the reclaimed lands were worth $146 per acre, being an average annual product of about $30 upon each acre reclaimed, and far more than remunerating for the heavy outlay.

The Study of Agriculture,

Is recommended by a writer in the North American Review, in the following extract:

"Now, although the paramount importance of agricultural pursuits, over all others, is unquestioned, we suspect there is scarcely a school or college, in the country, where a single hour is devoted to the elucidation of their leading principles; and we doubt not, that many have finished their academical courses able, perhaps, to repeat whole volumes of metaphysics in the words of the author, while they have not merely acquired no knowledge, but have formed no conceptions of those familiar operations of the farmer and gardener, to which they are indebted for their daily food. Surely some few days of the ten years pupilage, through which so many of our youth pass, might be profitably given to subjects so interesting, as well as so important, as these."

Couch, or Quack Grass,

Is collected, washed and sold as cattle fodder in Italy. Children follow the plough, gather, wash, tie in small bundles, and market it, when not wanted on the farm. It is also found to possess medical properties, and is prescribed in decoctions, like sarsaparilla, for scorbutic patients. It is stated in the Farmers' Magazine, that upwards of 170,000 dollars worth of gramminia is annually sold by the peasants to the inhabitants of the city of Naples alone.

Prices of Wool in England.

We have often heard it remarked, and we have concurred in the opinion, that our woollen manufacturers can afford to make a greater difference than they do make, in the prices they give for prime Saxon, and grade wool. The expense of manufacturing the two kinds differs but little, while the price of the fabric made from prime Saxon is generally double that made from grade wool. In the London price current for August, we notice the prices of wool were as follows: Electoral Saxony from 4s. 2d. to 5s.; first German wools 3s. 2d. to 4s.; Spanish Merino from 1s. to 3s. 2d.; native sheep's do. 1s. 6d. to 2s. 6d. There the prices of wool seem to correspond with the prices of the cloths into which they are converted—the Saxon being nearly double to the Spanish—here they do not correspond with the price of the cloths which they produce.

Improved Cross of Sheep.

Charles Vaughan, a distinguished breeder and farmer in Maine, has published in the Maine Farmer, letters highly extolling his improved breed of sheep, which are a cross of the South-Down with the Dishly, or new Leicester. The particular points of excellence are large size, hardiness, early maturity, and, we venture to add, from the known character of the South-Downers—excellence of mutton. Lambs of fifteen days old have weighed 20 lbs. and at five months have reached 65 lbs. upon ordinary keep. There is nothing unreasonable in the supposition, that the breeds of domestic animals can be improved here as well as they can be in Britain, provided we bestow upon this subject the same judgment and care that they do there. From what we have seen of Mr. Vaughan's writings, and heard of his practice, we are disposed to believe that he possesses high qualifications as a breeder.

Agricultural Schools.

The Derry (Irish) Journal informs us, that three additional agricultural schools have recently been established in Ireland, by the National Board.

On Improvement in Horticulture.

Read before the Horticultural Association of the Valley of the Hudson, by J. BUEL, *on the 28th Sept.* 1838.—*Published at the request of the Association.*

Recently notified that the gentleman selected to address you on this occasion, would fail in the performance of that duty, I have hastily prepared some remarks on the objects and promised utility of this association, which I beg leave to read.

Our first parent was placed in a garden, and commanded "to dress and to keep it;" thereby indicating, from the highest authority, that the garden is pre-eminently fitted for the performance of our highest duties, and the gratification of our purest pleasures. This construction of the Divine precept, is in accordance with the opinions of every enlightened age and nation. The garden has, by general consent, ever been considered a source of utility and of healthful employment—the best theatre for concentrating and displaying the beautiful and wonderful diversified varieties of foliage, flowers and fruits of the vegetable world—and a school for civilizing and socializing man, and of inspiring him with love to his Creator, and good will towards his fellow-man. Nor does the injunction seem to refer to the mere gratification of animal appetite;—for we read, that "out of the ground made the Lord God to grow, every tree that is pleasant to the sight, and good for food."

Gardening and Horticulture are in a measure synonymous terms. Gardening is divided into branches. It "is practised for private use and enjoyment," says Loudon, "in cottage, villa and mansion gardens;—for public recreation, in umbrageous and verdant promenades, parks and other scenes, in and near large towns;—for public instruction, in botanic and experimental gardens;—and for the purposes of commerce, in market, orchard, seed, physic, florists and nursery gardens." In all of these departments of Horticulture, we have great room for improvement, and great need of it; in all of them it is the object of this association to promote improvement, and in all of them they will effect improvement, if their efforts are seconded, as I trust they will be, by the intelligence, the taste, and the public spirit of the opulent gentlemen of our valley. It is the object of the association to introduce into this—our Eden—"every tree that is pleasant to the sight, and good for food"—to introduce, and to disseminate widely, all that is useful and ornamental in garden culture—all the fruits, flowers and culinary vegetables, that are worthy of culture, whether of foreign or domestic origin, which our soil will grow, and our climate mature.

It is not enough that many of the choice productions of the garden should be found with a few of the opulent. Those that are excellent should be known and disseminated widely. We should do good to others, if we would know the pleasures that spring from a generous philanthropy. By bringing these productions together at our semi-annual exhibitions, showing and comparing them, we can determine their relative merits, their proper names and synonymes,—can publish the result of these comparisons, and recommend and disseminate those which possess the greatest intrinsic merit. "All men will eat good fruit that can get it," says Sir William Temple; "so that the choice is only, whether one will eat good or ill;—and of all things produced in a garden, whether of salads or fruits, a poor man that has one of his own, will eat better than a rich man that has none." We seek to extend the luxury of good fruits to all, in order that the poor man who has a garden, may eat better fruit than the rich man who has none.

As I have remarked, gardening is co-existent with man. Its early history is too obscure to be traced. Suffice it to say, that in the best days of polished Rome, it was cultivated with taste and assiduity, and ranked with the fine arts; and that with these it sunk to obscurity in the downfall of that empire. All of the art that survived the shock of Vandalism in Europe, was preserved and cloistered with the monks during the dark ages. With learning it revived first in Italy and Holland; to which countries many exotics, and a taste for cultivating them, were introduced during the crusades. It was not until the reign of Henry 8th in the beginning of the 16th century, that gardening attracted much attention in England. Previous to this time, cabbages,

and even pot-herbs, imported from Holland, constituted luxuries, found only on the tables of the opulent. During this reign, apricots, melons, herbs and esculent roots, were first introduced into the royal gardens. Among the new plants of that day is mentioned "the lilacke trees, which bear no fruite, but only a pleasant flowere." Improvement in Horticulture was greatly extended under Elizabeth and Charles the first. During the reign of the latter, the first work upon English gardening was published by Parkinson, under the title of "A garden of all sorts of pleasante floweres, with a kitchen garden, of all manner of herbs and roots, and an orchard of all sorts of fruit-bearing trees," which is yet quoted with high commendation.

About the middle of the 17th century, several valuable publications upon Horticulture appeared in England and France; and in 1734 Philip Miller published his celebrated Gardners' Dictionary, an original work of merit, which attracted general notice, and gave a new impulse to improvement. British and other foreign works upon gardening, have been greatly multiplied; and improvement has kept pace, with the increase of wealth and refinement, until horticulture has attained to a high state of perfection, as a science as well as an art, in most of the civilized countries of Europe. No gentleman of opulence or taste there, deems himself fitted to enjoy the comforts and luxuries of life, without his garden. Horticultural societies have been every where established,—princes have been competitors in them, for honorary rewards; useful and ornamental plants have been sedulously collected from every quarter of the globe, and innumerable new varieties have been added to the catalogue by the skill and industry of man. Within a few years, the splendid Encyl opædia of Gardening, has been added to our horticultural works by the indefatigable Loudon, professing to give all that is interesting in the history, and all that is useful in the science, or in the practice of gardening. The society of London established a garden in 1818, and sent agents into every quarter of the world, to collect whatever could be found useful or ornamental. One of these agents, after traversing the United States and the Canadas, spent four years on the Pacific coast of our continent, exploring the country from California to the mouth of the Columbia, and thence across the continent to the Hudson Bay Factories, in collecting rare plants and seeds. In a subsequent voyage to the western border of our continent, this indefatigable agent was destroyed by a wild bull, upon one of the Pacific Islands. Yet the name of Douglass will be perpetuated in the cognomen of several new plants which he first brought into notice. Some idea may be formed of the extent of this society's labors and usefulness from the facts, that in its catalogue of 1830, are enumerated as growing in its garden, 3,400 varieties of hardy edible fruits, and 58 varieties of nuts, exclusive of 89 varieties of the fig, 182 of the grape, 56 of the pine apple, and 131 of the melon; nearly all of the four last named being cultivated in houses, with the aid of glass and artificial heat,—making an aggregate of about 4,000 varieties of fruits, which administer to the sustenance of man, independent of ornamental plants, which exercise a benign influence upon his mental enjoyments. The fruits in this garden have been classified, as it regards size and quality,—their form, colour, use and time of maturity noted, and their catalogue thus affords a guide in the selection of fruits for the climate to which they may be transferred for cultivation.

Enterprise in the acquisition of new fruits, and new plants, has not been confined to the London Horticultural Society. European governments, Horticultural societies, opulent amateur florists, and professional nurserymen, have sent their agents into remote parts of the world;—and the towering mountains of Asia, the Isles of the Eastern Archipelago, the burning sands of Africa, the inhospitable regions of Siberia, and the wilds of America, have been alike explored, for valuable and rare plants, to subserve our wants, and administer to our pleasures. The fruits of all their laborious researches lie within our reach, and a prominent object of this association is to transfer to the valley of the Hudson such of them as may found to administer to the wants and comforts of its population.

We are particularly indebted to the Flemings, for a great number of excellent new varieties of the pear. To the labors of Dr. Van Mons, of the University of Louvain, an amateur pomologist, we are indebted for about 400 new and excellent varieties of this esteemed fruit, some of which are in eating through the circle of the year. The late Mr. Knight, till his death president of the London Horticultural Society, also produced many new and excellent varieties of fruits, by artificial fecundation.—Samples of several of the new fruits thus produced by Mr. Knight and Dr. Van Mons are now exhibited upon your table.

From the comparatively restricted means of a new country, gardening has with us been limited to the useful, seldom aspiring to taste and elegance. But even in the useful branch we have ample room for improvement. We have no great central point for collecting and comparing, the indigenous fruits of our country, and for disseminating the excellent through our land. Of the apple, plum and peach, it is believed we have as fine native varieties as are grown in the world, and yet they are but partially known and but partially enjoyed. Individual exertions are too limited and feeble to effect the desired object. It can only be done by the combined exertions of many, influenced by a common impulse, and directed to a common end. In this age, no great good can be effected in any branch of public improvement, without the concentrated exertions of associate bodies. The garden culture of fruits and esculent vegetables, has hardly yet commenced in many districts of our valley, while in other districts the culture is but imperfectly understood—the relative merits of different varieties are not appreciated, and their value, in promoting the health, economy and comforts of a family, unknown or disregarded. Few of the fine varieties of fruit, or of the other choice products of the garden, are seen in passing through our country. Yet twenty years has done much to improve our Horticulture; and we have abundant reason to anticipate far greater improvements in the twenty years to come.

How few of our garden products, which are now considered, at least in imagination, indispensable to our wants, are the natural products of our country. Hardly one in twenty is indigenous in our soil. Our fathers have been collecting them, and we have been collecting them, through the lapse of centuries; and yet, how comparatively small is our stock, compared with what Providence has provided for the wants and comforts of man. We are strangers to many, very many, that grow naturally in our own country. And as to varieties, nature and art are every year multiplying them, under the same laws that multiply the breeds of our domestic animals, and that are diversifying the human countenance. Did our gardens contain only the plants that are indigenous to our country, the supply would indeed be scanty. But Horticulture has laid almost every clime, and every country, under contribution, to administer to our wants, and to gratify our senses. Most of our grains, and a large portion of our fruits, and esculent roots, derive their origin from other countries. The greatest part of them came to us from Great Britain and Holland, which received them from Italy, Italy from Greece, and Greece from Asia. Rye and wheat are indigenous in Siberia and Little Tartary; rice is the natural product of Ethiopia; buckwheat of Asia; kidney beans of the East Indies; the beet and onion, of Spain and Portugal. Peas came from the south of Europe, artichokes from Brazil, peppers and cucumbers from India; the egg plant from Africa; the tomato from South America; the pumpkin from Astracan; the ruta-baga from Sweden; the cauliflower from Cyprus; and the asparagus from Asia. Our fruits originated in countries equally remote from each other. Without pretending to decide upon the disputed questions, whether all the cultivated apples have originated from the wild crab, or whether any of our good varieties existed here when our shores were first visited by Europeans, I can say this much, that we have esteemed varieties of this fruit now under culture, which originated on the banks of the Po and of the Danube, of the Rhine and the Oler, of the Seine and the Thames, and on the shores of the Baltic and Caspian. The peach came from Persia; the plum from Syria; the cherry from Pontus; the quince from Austria; the almond from Barbary and China, and the pear from Europe. Our pot-herbs and cultivated medicinal plants, are also most of them exotics: parsley is from Sardinia, pursley from South America, nasturtium from Peru, thyme from Spain, sage from the south of Europe, savory from France, marjorum from Sicily, rhubarb from Asia, and balm from Switzerland. So also of our flowering shrubs and plants; the pink, the daffodil, and narcissus, are from Italy, the dahlia from Mexico, the ranunculus and anemonie, from Cappadocia; the hyderange, balsam and camelia from China and Japan; the tulip and hyacinth from the Levant; the tuberose from Ceylon, and our finest peonies from the "Celestial Empire." And of trees, we are indebted to the north of Asia for the ornamental horse-chesnut, and to the Indian islands, for the towering ailanthus. These are but a small portion of the contributions which Horticulture has gathered from foreign lands, for our convenience and pleasure; and every year adds to the list new genera, species and varieties. Providence seems to have apportioned its bounties among the different nations, as if to admonish them of their mutual dependence upon each other, and to excite in them a spirit of christian philanthropy and benevolence.

Private gardens of great extent and beauty abound in most of the countries of Europe, and they are maintained at a princely expense. In these not only hardy fruits and vegetables are forced to early maturity, by artificial means, but most of the tropical fruits are brought to perfection, by the aid of hot-houses and walls.—Strawberries, in this way, are produced for the table in April, melons in May, grapes and peaches in June, and pine apples at almost every season. It is assumed, that in Britain, a gentlemen may derive from his garden, with the aid of glass and artificial heat, a more varied and richer dessert, throughout the year, than is to be met with on the most luxurious tables in any other country. And yet the summers of England are so cool, that the peach, grape, melon &c. require the protection of a wall or glass, to bring them to maturity; and even our fine Spitzenbergh apple does not ripen well there without a wall. Gardens of this description, though generally on a limited scale, may be found in the vicinage of our commercial towns, and will doubtless be multiplied as we advance in wealth and horticultural improvement. These cases of high improvement, or rather extravagant refinement, in horticulture, are not mentioned as models for general imitation. They indicate an expenditure which few here can prudently indulge in if they would. Yet where there is the ability, and a disposition to extravagant expenditure, it may be indulged in, in horticulture, with advantage, rather than prejudice, to public morals and public usefulness. The examples to which we refer, furnish models of improvement, which we are at liberty to adopt on any scale that shall comport with our desires and our means.

Public nurseries, which belong to Horticulture, are highly useful to all communities in which they are located. They serve to introduce and concentrate the vegetable productions of every country, which are likely to subserve our wants or administer to our rational gratification. The interchanges which take place between those of Europe and America, are now managed with such facility, that a new fruit, or a new flowering plant, which attracts notice, and acquires value, on one continent, in a year or two becomes common in the nurseries of the other. The numerous horticultural periodicals of the two continents, make us early acquainted with whatever is new or valuable in either, and a single season serves to propagate and to disseminate the desirable plant on both. In this way we have been enabled to obtain the fine new varieties of Flemish and French pears, in many instances before they had fruited in England. The dahlia, in its natural single flower, was first introduced into France in 1801, and subsequently into England. The skill of the horticulturist has since transformed it into a double flower, and imparted to it all the colors and tints which are gratifying to the human eye. This ornament of the garden, which is now found at all our nurseries, is termed by common consent, "The King," as the rose has been called "The Queen of Flowers." And as regards fruits—I was instrumental in bringing into notice, seven or eight years ago, a fine new apple, the *Jonathan*, grafts of which I forwarded to Europe. Five years ago I noticed it in the catalogue of the Lon. Hort. Society, with the names of many other of our local fruits which I sent, and also in catalogues from the Island of Jersey, and from Hamburgh. The stroat apple which I sent at the same time had produced fruit in 1830, in the Lon. Hort. garden, and was classed, as it deserved to be, among the first quality of apples. The ailanthus was first brought to our country eight or ten years ago, by one of our consuls, from farther India, and it is now growing, I believe, in almost every state of the Union.

As having particular relation to those who depend upon market gardens for horticultural productions, for daily use, I take occasion to remark, that the quality of market garden productions depends materially on the judgment and liberality of the buyer. The object of the gardener is profit; and so long as the purchaser regards the price rather than the quality, he will continue to raise those varieties which give him the greatest products, which are generally those of inferior quality. The difference in the varieties of the same vegetable are manifestly great. This exists not only in their flavor, but in their nutritious and healthful properties: some varieties, particularly fruits, being absolutely prejudicial, while other varieties of the same species, are highly conducive to health. In the potato, for instance, the difference in nutritive matter amounts to nearly a half in different varieties. Some of the coarser kinds yield but 14 and 16 per cent of nutritive matter; while some of the finer kinds have given 28 per cent. And it is worth regarding, that good quality is almost inseparably connected with grateful flavor.

Horticulture, as an employment, is highly conducive to the healthful vigor of the body, and to an agreeable exercise of the mind. The labor it demands, is neither severe in degree, nor monotonously tiresome in kind.—It affords continued change and variety. The interesting objects of which it has cognizance,—as the germination of the seed, the development of the leaf, the growth of the stock and branches, the expansion of the flower, the swelling, maturing and gathering of the fruit, and the diversity in foliage, flowers and fruit, of the various vegetable families under its care, present to the mind, capable of appreciating and admiring the beauties of the vegetable kingdom, a succession of the most agreeable sensations.

As a recreation, Horticulture offers all the pleasures I have enumerated, without the fatigues which accompany its manual operations. What more grateful, to the sedentary and the studious, or to him who is habitually involved in the mercenary cares of business, than the relaxation afforded by a well kept garden, which exhibits to the senses, the fragrance, the beauty, the order and harmony, which Providence has imparted to the vegetable kingdom. Here is nothing to awaken jealousy, to excite distrust, to beget envy—or to inflame any of the grosser passions; but every object is calculated to tranquillize the mind, to soften down the asperities of his nature, and to beget, towards his fellow beings, feelings of kindness, philanthropy and love.

As a science, Horticulture is rich in stores of intellectual wealth and usefulness. It embraces glossology, which teaches the names of parts of plants; phitography, or the nomenclature and description of plants; taxonomy, or their classification; vegetable organology, or the external structure of plants; vegetable anatomy, or their internal structure; vegetable chemistry, or primary principles of plants; vegetable pathology, or the diseases and casualties of vegetable life; vegetable geography and history, or the distribution of vegetables, relatively to earth and to man; and the origin of culture, derived from the study of vegetables.

It also embraces the study of the natural agents of vegetable growth and culture,—as earths, soils and manures; the agency of light, electricity, heat and water, in vegetable culture, and of the atmosphere in vegetable development.

Whether we regard Horticulture as an art, or a science; whether we consider it as administering to our wants, convenience and pleasures, or as promotive of

health and useful knowledge,—it has high claims to our notice and regard.

I present upon your table, for examination, gentlemen, more than one hundred named varieties of the apple and pear, collected from my grounds, which twenty years ago were a barren waste; and I might have added many others of doubtful or inferior character. Those presented have all been recommended as superior fruits, at the season of maturity, either for the dessert, the kitchen, for preserves, or for cider. They are the natural products of the northern and middle states, of Canada—and of Russia, Germany, France, the Netherlands, and Great Britain. They include of course only late autumn and winter varieties. Yet these fruits form but a small portion of the kinds which are to be found in our valley—much less in our country. Though we have a great many *good* kinds, there must be but comparative few that can be denominated *excellent*, or *best*. The only way to determine which are the best, is to bring the different varieties together, and to judge of them comparatively, at the season of their maturity. How desirable it is, that when starting in our pomological career—when selecting the fruits that are to administer to our enjoyment and our profit, through life, we be able to select the best kinds? But who is now a competent judge in these matters? What individual knows the comparative merits of half, or a quarter, of the fruits which abound in our land? Not one among us, I venture to say. How shall we then acquire the requisite knowledge? We have at present no competent guide to direct us in the selection. Individual effort is incompetent to the labor of classifying and describing all our best fruits. It can only be effected here, as it has been done in England, by the joint efforts of an association—by bringing together the various kinds, testing their qualities, and establishing a standard of their relative merit, for the various uses for which they are adapted. This subject is so deeply connected with the comfort of all classes of our citizens—of the buyer as well as the cultivator of fruit—that I venture to recommend it to the early attention of the association.

The introduction of new and valuable varieties of fruits, seeds and ornamental plants, from different sections of our own country, as well as from the old world, should also engage our early attention. Many facilities present for effecting this. First, by a correspondence, and interchange of plants, seeds and fruits, with horticultural associations at home and abroad. Secondly, through the depot established at Washington, under the direction of an enthusiastic friend of rural improvement, H. L. Ellsworth, Esq. the commissioner of the Patent Office. Thirdly, through our naval, commercial and travelling citizens. Our Corresponding Secretary, who has tendered his resignation in consequence of being about to take up his residence for some years in France, has kindly tendered his services in this behalf—and his services there, in forwarding the objects of the association, may be rendered extensively useful. After all, much, very much, will depend upon our individual exertions. If we show a spirit to go ahead, and to be useful to the community, assistance will be tendered from every quarter. But only those who *do* exert themselves, can or ought to expect assistance from others. We must put our own shoulders to the wheel, before we call upon Hercules. We *can* render this association pleasant and useful to ourselves, and highly beneficial to the public, if we but resolve to do so. But unless we set out, and persevere, in the resolution to do so, we had better suffer the association to die in embryo, and to forget that we had the ambition to be useful in promoting horticultural improvement, but lacked the resolution and the spirit to carry out our laudable design.

In conclusion—to the gentlemen who have interested themselves in getting up this exhibition, and particularly those of a sister state, whose contributions of superior fruits and flowers afford the strongest incentive to perseverance on our part, I feel myself authorized to tender the grateful acknowledgments of the association. A multiplicity of circumstances, and I may say of misapprehensions, combined with protracted bad weather, have tended very much to diminish the interest of our first exhibition; and yet I believe I may venture to say, that there has never, on any occasion, been collected in our state, a greater number of excellent varieties of fruit, or finer samples, than has been exhibited on this occasion; and although the season has been highly unpropitious to the floral department, yet the exhibition of fine dahlias, the favorite flower of the season, has been peculiarly brilliant. We have no reason to despond, but much to induce perseverance and renewed exertion. We have laid the foundation of improvement in that branch of industry which administers largely to the wants and elegancies of life. We can rear the superstructure. We can *deserve* success, though we cannot *command* it. And even the high satisfaction of doing this, is a consoling, if not satisfying reflection, to him who derives pleasure in laboring for the public good.

Advantages of Planting Fruit Trees on Declivities.

Dodart first observed that trees pushed their branches in a direction parallel with the surface of the earth. If a tree stands on a steep it pushes both towards the hill, and towards the declivity; but on both sides it still preserves its branches parallel with the surface. As there is an attraction between the upper surface of leaves and light, I am also persuaded, though not equally certain of it from experiment, that there is an attraction of the same nature between the under surface of leaves and the surface of the earth. This I consider the true cause of the phenomenon;—I had long observed that the most fruitful orchards, and most fertile trees, are those planted on a declivity, and the steeper it is, though not quite a precipice, the more fertile they prove. It is well known that the spreading of trees always render them fruitful. On a plain they incline to shoot upwards; and therefore art is employed by skilful gardeners, and applied in various ways to check their perpendicular, and to promote their lateral growth But this point is obtained on a declivity by nature. There a tree loses its tendency to shoot upwards, and in order to preserve its branches parallel with the surface, is constrained to put them in a lateral direction. Hence an important rule in the choice of orchards and fruit-gardens.—*Rev. D. J. Walker.*

There is another advantage in planting on declivities, particularly where there is a retentive subsoil—water does not stagnate about the roots of the trees, as is often the case upon level surfaces, but passes off freely down the inclined plain, and the trees are consequently more healthy and vigorous.

Notices to Correspondents.

We received, too late to be noticed in our last, a communication from a *mercantile* correspondent, expressing a strong inclination to become a farmer, but who is deterred by the fear, that, like many others who start in a rural career, he will become tired of farming and the country, and sigh again for city life. He askes us to explain the causes of this frequent disappointments and to suggest the antidote. We take the cause of the disappointment generally to be, that when city gentlemen turn farmers, they place their dependance of enjoyment upon wrong objects—upon the fruits, and not upon the labors of the farm. Accustomed to the busy throng,—possessing little knowledge of their new business, and either not the disposition or the patience to acquire it, their time hangs heavily on their hands; they soon find themselves disappointed in their expectation of profit and of pleasure, without a manly effort to secure either, and ennui drives them back to the city. The antidote lies in taking a direct and active interest in the labors and business of the farm—of devoting to it his mental, and at least a portion of his physical powers—and of persevering in his efforts till he understands something of the theory, and is familiar with, and can direct with judgment, the practical operations of the farm. Having attained this point, and conformed his habits of living to his situation, there is little danger that he will again sigh for city life.

We received also, cotemporaneously with the preceding, a communication from a *medical* correspondent, who is now a noviciate in husbandry, and who has described his farm, and asks our instructions in its management. We fear our medical friend underrates the business of farming, and over rates our capacity for instruction.—Should we ask his direction for the medical treatment of our family, although we should attempt to describe to him their constitutions and habits, he would probably reply to us, that medicine is a profound science, acquired by long study—an art, thoroughly mastered only by long practice—that he could only give general direction for the treatment of diseases—and that all special directions must be preceded *by an examination of the patient to be prescribed for.* Our correspondent will see from this analogy the task he has imposed upon his, and that we might subject ourselves to the charge of *quackery*, were we to attempt to prescribe in his particular case. A knowledge of agriculture cannot be infused into one by *inoculation.* It must be acquired *the natural way.* As a science it must be acquired by patiently studying the principles upon which it is based. As an art, it demands persevering practice to become a competent master. All we can do, is to advise Dr. H. to study agriculture as he studied medicine—make himself familiar with the nature and qualities of his soil, tamper a little with experiments, notice their effects, and he will ultimately settle down upon the best modes of practice. It may seem hard for him to undergo a second course of studies; but he may rely upon it, that the best counsellors are personal knowledge and experience. The Doctor, we believe, will find most, or all, of his special questions answered in the volumes of the Cultivator, either directly or indirectly.

Draining.—B. F. Wells, of Suffolk, has sent us a description and diagram of a salt and fresh meadow, which is rendered in a measure valueless by reason of the fresh water which saturates it, and is subject also to be inundated with sea water at high tides. He askes our advice as to the best mode of reclaiming it. The salt water must be kept out by an embankment, and gates that close with the flood tide, like those we have seen at Newark, N. J. The source or fountain of fresh water must be ascertained. If it is in the surrounding high grounds, it may be intercepted and carried off by underdrains, sunk into the hard pan, above the level of the meadow. It may be extended, if necessary, entirely around it. If the source is in the bottom of the marsh, the evil seems incurable, as it would seem to lie too low to be drained, without permitting an influx of salt water, at high tide, through the underdrains.

Influence of agriculture and manual labor schools.—We have two communications on this subject, which, we are sorry to say, are too carelessly written to appear without correction, which we have not yet found time to give them. Both of our correspondents seem to consider manual labor as agricultural schools, and that they are calculated to promote general improvement in the science and practice of agriculture. This, we believe, is not pretended to be the case in any existing manual labor school; and if so, we have not been advised that it has, in any instance, been successful. The pupils in these schools are not generally designed to be farmers. They work for health and economy, and not to learn the trade and mystery of farming. We should be sorry to have it believed, that these are a fair test of the utility of agricultural schools.

Miller's Tolls.—We are not aware that any benefit will result, either to individuals or the public, from prolonging this controversy. It seems to be admitted on all hands, that the miller has a right, by custom if not by law, to take a *tenth* for toll—and no more. If our Oswego correspondent has had a *twentieth* abstracted from his grists, as he alleges, he has been cheated, as we have been; and he has his remedy against the miller—or he may send his work to a more honest man.

CORRESPONDENCE.

On Rotation of Crops.

Dear Sir—Although I have not the pleasure to know you personally, such is my confidence in your devotion to the cause which you are so successfully laboring to promote, as well as in your liberal indulgence of opinions opposed to your own, that I shall offer no apology for the following remarks elicited by your interesting article entitled "Rules and Suggestions in Husbandry." All of those I deem highly valuable: but there are a few which, although they have almost become axioms, appear to me at least *doubtful*, notwithstanding they are sustained by such a host of celebrated authorities, that any individual who ventures to question them incurs the risk of being called quite presumptuous. This risk, however, I am willing to run in, the hope of exciting some abler and more experienced agriculturist than myself to a full discussion of a subject so important to all cultivators of the soil as that which forms one of the chief topics of your article,—I mean, *the rotation of crops.* But to proceed with my comments.

In your 18th rule or suggestion you say,—"The natural fertility of a farm cannot be kept up or increased, where arable and mixed husbandry prevail, from the resources of the farm stock, without resort to an alternation, or change of crops. Although the diminution of fertility may be imperceptible in some extraordinary cases—and although some soils seem naturally and peculiarly adapted to certain crops,—yet, where the same crop is grown on one piece of ground in successive years, deterioration as certainly goes on as the sun shines by day."

Here, in the first part of your second sentence, although you evidently make an exception to the universality of your rule, *that* exception is entirely done away by the positive unqualified assertion in the last part. This naturally suggests the following question;—how is an imperceptible deterioration to be ascertained, and if *that* be practicable, can it be worth regarding in any of those cases, where it is so slight,—so gradual that nobody can see it?

The 19th rule declares, "that two white, or grain, or culmiferous crops, should not be made to succeed each other in the same field."

Now, in opposition to the universality of these rules, the facts which have fallen under my own observation, together with those communicated to me by perfectly veracious agriculturists, are so numerous and remarkable as to have made me, if not a decided infidel, at least a sceptic in regard to the absolute necessity of a rotation in crops, for the purpose, either of creating or preserving the fertility of soils. That *some* rotation is generally beneficial, and in a degree well worth regarding, I have no doubt. But like thousands of other good things, I feel equally confident, that its benefits have been immeasurably exaggerated, and thereby have prevented its adoption to the extent to which it might and probably would have been carried, had no Baron Munchausen-tales been told about it. Many an excellent practice has failed to become general, solely from the circumstance that the first who adopted it on the recommendation of those who claimed to be the inventors, did not half realize the promises made in its behalf. Exaggeration is the besetting sin of almost all inventors and discoverers, and this folly often deprives them both of the credit and the profit of their discoveries and inventions.

Permit me now to state a few of the facts which have produced my scepticism. The two eastern shore counties of Virginia comprise a large extent of country. The soil is generally sandy, and not such as is usually deemed either the most fertile or the most lasting: yet all with whom I have ever conversed, confidently declare, that their lands at least "hold their own" although they have been generally cultivated, for a long series of years, without rest, in alternate crops of corn and oats, and without apparent diminution of the amount of produce. The inhabitants ascribe this to a natural growth which they call a bean, but which is in fact a pea that almost invariably succeeds the oat crop,

and is turned into the land when ploughed up for corn. Here, then, is a formidable exception of great extent, to the rotation creed, as well as to the poisoning system of Monsieur Candolle and others: for in two very large counties of Virginia, two white crops of grain constantly follow each other every year, without any perceptible deterioration, as the owners and cultivators of the soil all assert; and this too, in most cases, without any return to the land, of fertilizing matter, except the dead natural growth of the pea. Could this possibly happen, either if rotation was as indispensable as it is alleged to be; or, if the poison-fanciers were right in their strange notion? If *their* creed were true, neither corn nor oats could any longer propagate their breed in Accomack or Northampton; for both would have deposited by this time so much deadly poison for their offspring, that none could ever germinate, much less continue a healthful existence. Again, if your opinion be correct, the average equality of the corn and oat crops in these counties, for so long a period, without any alternation whatever, except from one to the other, can be accounted for only by supposing either that the soil of our eastern shore counties originally contained such a superabundant store of the peculiar food of corn and oats, that half a century has not sufficed to exhaust it; or that the natural growth of the pea restores annually, the quantum sufficit of this food to maintain from year to year the alleged equality of product. The fact itself cannot be doubted, unless we can persuade ourselves to believe that every cultivator in the two counties has deceived himself, which is hardly possible.

In several other parts of Virginia, I myself have seen pieces of land whose owners have assured me had been constantly cultivated in corn without rest, for ten, fifteen, and twenty years, and in some cases still longer, without apparent diminution of crops except in bad seasons. The same assurance has been given me by many tobacco-planters in the James-River country, as to the continued culture of that crop, on the same land,—even for thirty years in succession; and likewise of corn and wheat alternately, for similar periods, on other portions of that territory. Only a few days ago, talking on this subject with a friend from one of our counties bordering on the Chesapeake, he told me that the best crop of wheat he ever made, was on a piece of land from which he had taken a crop of oats only a few weeks before he sowed the wheat; and I have heard similar statements from others whose word I could not doubt. In most of these cases I understood that no manure was used, unless the weeds and stubble could be so called, which were turned under by the plough.

Take one fact as to cotton. Several years ago I was accustomed to visit a near relation who, for twenty odd years, cultivated this plant in a few acres near his house,—the soil of which, although good, appeared to have nothing peculiar in it,—nothing indicating any essential difference between that and other common soils of similar quality, on our tide-water-rivers. I saw the crop of cotton almost every year during the greater part of the time, and never could perceive any difference, in similar seasons. The proprietor himself always assured me he found none in the product, but what was manifestly attributable to the variation of the seasons,—the crop of one good year being quite equal to that of another. The only manure given to this cotton was drawn wood ashes, in which the seed was constantly well rolled before planting.

Let me now state a few facts as to garden vegetables, in opposition to the rotation doctrine, and the supposed necessity for a change of seed. In the tide-water portion of our state, I once saw, at a lady's table, some Irish potatoes of so good a quality, that I was induced to inquire where she procured her seed, and how she cultivated them. She informed me, that she had used the same seed for eighteen years, and had raised them every year, in the same square in her garden, only adding the usual quantity of manure in the trenches, every time of planting. The soil of her garden appeared to me much the same as is common with us. Of some other table-vegetables I can speak from my own experience; for example, the English pea, (as we call them,) the snap-bean, and the Siberian cale.* These I have cultivated for a number of successive years, without any change of seed or situation, and in similar seasons have never discovered any difference, either in quality or quantity. The manure used has been either from the horse stables, or drawn wood ashes.

To the foregoing statements it may perhaps be objected, that they contain more matters of opinion than of fact. True it is, that I have given no results of actual comparative measurements; but it is hardly conceivable that so many farmers and planters as have referred to, could have been cultivating corn, wheat, oats, and tobacco, for nearly half a century, without over measuring their crops. This is never omitted, although in some instances probably, less accuracy may be practised than in others. Still a measurement is always made with sufficient particularity to warrant the opinions I have stated, derived from so many different individuals, in different parts of Virginia, and concurring with a degree of unanimity which could hardly be possible unless sustained by similar facts. Taken all together, they appear to my mind most indisputably to refute the plant-poisoning-doctrine; and if not greatly to invalidate the rotation-creed, at least to throw in its way, some obstacles which I can perceive no satisfactory means of removing. If there are any I should be highly gratified to learn what they are. I am not conscious of any prejudices on either side; but notwithstanding the fearful odds against me, I must believe from an experience of nearly "three score years and ten," that some very profitable farming *may be* rationally expected without any rotation of crops, provided only that suitable manures, and in sufficient quantities, be annually applied to the arable parts of every farm.

Let me beg you, my good sir, not to mark me down as an utter infidel—guard the rotation system. To a considerable extent I profess myself a believer; but acknowledge, with all due humility and apprehension of reproof, that I am a bit of a sceptic, as to some of the marvellous benefits ascribed to the mere alternation of crops; for in almost every case to which I have paid particular attention, the effects seemed quite as much attributable to manure, as to rotation. Still I am willing to admit—nay, I finally believe, that the best system of husbandry is inseparably connected with, and dependant upon both.

In connection with this subject, there is an opinion very prevalent among us as to the comparative power of different crops to exhaust or improve land, which seems to have more in it of fancy, than of fact. I am aware that some European gentleman, (of what profession I do not recollect,) has published a table, which has appeared in our agricultural papers, wherein he professes to have ascertained this power, to the ninth part of a hair; but has left us utterly benighted, in the slough of despond, as to the modus operandi,—although, if he is a real practical agriculturist, he might readily have concluded his table would prove such a stumbling-block, such a pons asinorum, in the way of us American clod-hoppers, that we never should be able to get over it without farther aid, than the mere tabular statement affords. The existence of the exhausting power in all crops, is too manifest,—too much a matter of daily observation to be denied; but what crop exerts it most, and the exact degree of such exhaustion, I humbly conceive, to be among the "unknowable things" of this world. One common notion, however, this table unquestionably *disproves*, which is, that some crops actually *improve land*, and hence are called *improving,—ameliorating crops*. Now, I would most respectfully suggest to all my agricultural brethren who read your highly useful paper,—(and I venture to call them brothers, because I myself feel the sentiment of fraternity for all,) that if any general rule whatever can be established on this subject, it may be expressed in something like the following terms: *All crops, if taken entirely off the land, exhaust in proportion to the number and size of the spongioles of their roots, and the time consumed in their growth and maturity; and none actually improve, but such, (if any such there be,) as return to the soil more of the food of plants, than they consume.* This I consider a universal rule; but if any one can produce what he believes to be an exception, I pledge myself at least to *the attempt* of disproving it.

A word or two in conclusion, and I shall cease to tax your patience with any more of my lucubrations. I assure you, in perfect sincerity, that they have been prompted solely, by an anxious wish to promote *our* cause,—*that* cause which I verily believe to be the main-spring, the only true source, both of individual and national wealth, prosperity, and happiness. If you believe this communication may, in any degree, contribute towards these vital objects, *then* I wish you to publish it; otherwise, it is my wish that you burn, or use it as waste paper. Its style and general character may possibly need some explanation,—nay some apology, with the graver, more solemn portion of our brethren. If such apology be required, here it is. *My* experience has thoroughly convinced me, that plain naked statements of facts in husbandry, however important they may be, are such soup meagre diet to most of our brethren, that very few, comparatively speaking, can be prevailed upon, ever to taste, much less to swallow such cookery. With this fact indelibly impressed upon my mind, I have endeavored to season the dish which I have offered to you and your readers, although it is with much fear and trembling, lest it may force upon your memories the old adage, —that, "God sends meat, but the devil sends cooks." I remain, dear sir,

Yours very respectfully,
JAMES M. GARNETT.

REMARKS.

We most cheerfully give insertion to the preceding communication, and not the less readily because some of its opinions seem to conflict with our own. We say *seem* to conflict—for we are still of the opinion, that were our views mutually understood, there would be found to be no great matter of difference between us. Besides, it is by free and liberal discussion—by the collision of opinions—that important truths are often elicited, and improvements made. The high standing of our correspondent, and his long practical experience in husbandry, will always render his favors acceptable to the conductor, and interesting to the readers of the Cultivator, however highly "spiced."

We must in the outset wholly disclaim being a disciple of the "plant-poisoning" theory of De Candolle and others. We have uniformly considered it illusory. But we do contend, that each species or family of plants require, and do tend to exhaust the soil, of specific portions of its fertilizing matters; and the exceptions taken by our correspondent do not seem to invalidate our general proposition. Our position is in a manner proved by the fact, that wheat requires carbonate of lime, clover, gypsum, &c. and that some soils will bear a succession of some kinds of crops, and not of other kinds. A soil may contain a large proportion, say twenty per cent, of the specific of food wheat, or corn, or tobacco; and as not more than a half, or a quarter per cent of this may be required or taken up, by a single crop, the supply would last forty or fifty years, without *perceptible* diminution, and yet at the end of the period would become wholly exhausted of it. For we believe the elementary food of plants combines in definite proportions, and that crop takes from the soil, of its specific food, not in proportion to what the soil contains of this food, but only what is required, by the laws of vegetable nutrition, to supply its absolute wants. We are induced to this conclusion by the fact, that on analysis, every farm crop is found to contain about the same elementary matters, and in the same proportions, on whatever soil they are grown—poor or rich—which they would not do were they permitted to gorge themselves with their favorite food, or were wholly deprived of it. It was these considerations which induced us to say,—"that when the same crop is grown on one piece of ground, for successive years, deterioration as certainly goes on as the sun shines by day."

And how is this proposition disproved, or even weakened, by the facts detailed by our correspondent? He tells us, in the first place, that corn and oats have been alternated in Accomac and Northampton, for half a century, without perceptible diminution of product. Are corn and oats "the same crop?" Besides, the pea, the bean, or the vetch, which always accompanies the oat, and which is turned under as food for the corn—is this nothing?—is not this virtually a *three* course system, instead of being a succession of the "same crop?"

The great wheat grown after the oat crop may be explained, though we do not mean to say correctly, by supposing what often takes place, that the oats were sown on a fresh turned ley, and that the vegetable matter of the soil only became soluble, or but partially so, after the wheat was sown.

The potatoes and the garden products, it seems, received an annual supply of manure—and this manure probably abounded in the specific food of the plants. Every field of a farm would probably continue to yield like the potato, the pea, &c. and supersede rotation of crops, "provided only," to use our correspondents words, "that *suitable* manures, and in *sufficient quantities*, be annually applied to the arable parts of every farm." It is the difficulty of obtaining this manure, of suitable quality, and in sufficient quantity, from the available means of the farm, thus annually, for every arable field, that a resort to alternating crops is deemed necessary.

The truth of the matter seems to be, that we meant to give *general* rules, and our correspondent has shown, that like all other general rules, they are liable to *particular* exceptions. But let us put the question fairly: How will the general principle, or rather the want of a due observance of it, apply to Virginia, for instance? Have not successive crops of wheat, of corn, or of tobacco, greatly deteriorated some of her once fertile soils? Have they not reduced thousands, and tens of thousands, of her good acres to comparative sterility—to unproductive commons? If these questions are answered in the affirmative, they will in some measure sustain us in our general rule. If in the negative, we would ask, from what cause then has deterioration resulted?

We have said thus much in defence of the theory of rotation, not in the spirit of controversy, but because we deem it a valuable collateral branch of improvement whenever it can be reasonably adopted. So far as the experience of twenty years has enabled us to judge, we think its advantages manifestly great, not as a substitute for manure, but as an auxiliary. —*Cond. Cult*

Rotation of Crops.

Bucks Co. Pa. 9th mo. 27th, 1838.

J. BUEL—I observed with pleasure, in the 7th No. of the Cultivator, the following course of crops suggested. 1. Roots or Indian corn, with long manure upon the sod: 2. Grain, with grass seeds: 3. Grass, for two years.

Wheat, rye, barley and oats are the principal grains with which I am acquainted. But as clover, and I expect grass seed generally, takes but poorly upon oats, I think it would be prudent to discard that grain altogether in such a rotation. The others may any of them succeed corn; but wheat or rye cannot, either of them, well be sown after beets or turnips; and I suppose, as a general rule, not after potatoes, parsnips or carrots. Barley, then, ap-

* This I beg leave to recommend as preferable to all other winter-greens.

pears to be the only alternative after roots.* But as it will not be advisable, as a common practice, to give up "bread stuff," we must raise wheat or rye, and therefore corn. If, then, we confine our rotation to corn, wheat or rye, and the grasses, we drop "an important link in the chain of alternation," and thereby lose "one of the best gifts which modern improvement has bestowed upon husbandry," ROOT CULTURE: and also introduce the unadvised plan of putting one crop in the ground soon after another of the same kind has been taken off. To obviate these difficulties the following rotation suggests itself: 1, corn: 2, wheat, or rye: 3, grass: 4, roots: 5, barley: 6, grass. There are two particulars in this course upon which I wish to be better informed. Wheat and barley, I think, exhaust nearly the same kind of nourishment from the soil, or require the same specific food. If this is a fact, could there not be some other crop profitably substituted for barley, which would not feed so extravagantly upon the elements which produce the "staff of human life?"

In some parts of Jersey rye is sometimes sown among corn, early in the fall, and a good crop mostly reaped the following summer. But to put wheat in after corn it is necessary to cut up the corn and carry it off previous to ploughing the ground. The stumps are then to be disposed of. And withal, some seasons, the corn does not ripen timely to afford an opportunity of getting the wheat put in properly, in season. The question then arises whether this is not the place to profit by some of the "powerful auxiliaries to the fold yard," mentioned in the following extract from the Cultivator.

"Green crops, that is, clover, buckwheat, rye, oats, &c. ploughed under as food for plants, are enriching crops, and powerful auxiliaries to the fold yard, but they are too seldom resorted to for this purpose."

Buckwheat and oats would require to be sown so late in the season that the ground would necessarily be exposed a long time to the scorching influence of the sun. I therefore conclude it would not be advisable to depend upon either of them alone. The advantage resulting from ploughing under a good clover sod for wheat is too well understood to need much comment. But sown among corn immediately after the last dressing it is rather too uncertain a dependence of itself for this purpose; though I have seen it sown at this time when it mowed a tolerable swath the following summer. I have known rye sown among corn for sheep pasture during the winter and early spring, and then ploughed under. And I have heard it said that rye, when pastured, becomes, like some of the grasses, almost perennial. The question appears to be, whether it would not answer a good purpose to sow rye and clover together, among corn, immediately after the last dressing, and pasture them during that fall and the following summer, and then plough them under for wheat? Is it not likely that such a practice would be an advantage to the wheat crop, and ultimately to the farmer's purse? If there would be any advantage in deferring the wheat crop a season after the corn is taken off, I would suggest the following course, desirous that any improvement may be pointed out which may present: 1, corn, with long manure upon the sod; sowed with clover and rye during the summer: 2, pastured and sown with wheat: 3, wheat, with grass seed; orchard grass where clover does not take well upon wheat after clover: 4, grass two years: 5, roots manured: 6, valuable substitute for barley, with grass seed: 7, grass one or two years. Poh! says the farmer, that course will never answer for me; I shall have to cut my fields all up into little bits. But, say I, the way to raise a good crop is to put in but little ground—do that well, and give it good attention afterwards. And we are thereby enabled to let such a length of time intervene between two crops, of the same kind, as to afford an opportunity for the elements which form the specific food for that crop to accumulate in such abundance in the soil as to induce a reasonable hope of an ample reward for our patience and pains.

I have no doubt but that in a course similar to this, the quantity of animal food for winter, would be greatly increased—thereby a much heavier stock might be kept: and accordingly, a large increase in the quantity of manure, which is said to be "the farmer's wealth."

But the desideratum appears to be a *valuable substitute for barley*, which will not impoverish the soil for wheat, and which is not quite so much of an enemy to young clover as oats. If it is a summer crop, to be fed in the fold yard, all the better for their land. M.*.*

*At the north, where the grain-worm prevails, spring wheat is generally sown instead of the winter varieties. This may follow any root crop.

Benefit of Applying Plaster.

Mr. J. BUEL—The beneficial effects of plaster on different varieties and species of vegetation are generally understood in expediting the germinating portions, and in advancing the young and tender plant in its incipient growth; but a development of its power and virtue, at different periods throughout the growing process, under a certain state and condition of the earth and atmosphere, has not been either sufficiently investigated or made public. During the excessive heat and drought which visited this section of county, in common with many others surrounding, and in some instances detached portions as it respects the latter, our late summer crops, under ordinary circumstances, suffered severely; the potato crop being quite light, and the corn crop short of an average yield. About four acres of corn, planted on the 10th of May, on a gravelly soil in good condition, much of which, however, had not a depth of more than ten or twelve inches, reposing on a slate rock. On the third week of the drought the leaves began to fold, and continued so until all hopes of a crop were at an end: most of it was in silk and setting. I sowed half of the piece most injured with plaster, broadcast, over the leaves, a bushel and a peck the acre, after sunset. The beneficial effect derived from it was almost instantaneous; its attractive power in absorbing the moisture, and probably other fertilizing principles from the atmosphere, in three or four days restored its healthy appearance much; the other half of the field, more favored with a deep, rich soil, was apparently much less injured by the drought; the whole piece was plastered before it was hoed; the half receiving the second plastering turned out the greatest yield: the drought continued for ten days after the second plastering; a few rows on the margin, of a similar depth of soil and equally fertile, which was not plastered, produced not half as much. About an acre of potatoes, planted in the same field, and plastered broadcast at the same period with the corn, at least doubled the product.

We all know that frequent experiments have been made on wheat, oats, corn and potatoes, at an advanced growth of those products, by sowing plaster, broadcast, over their tops or leaves, without any apparent beneficial effect. I have tried the experiment twice on potatoes and once on corn, without much success: the reason was obvious; the atmosphere was warm, and the earth supplied with a sufficient quantity of moisture.

The main and almost exclusive virtue in plaster is to keep up a moderate degree of warmth, and to supply, through the medium of the leaves, that moisture and fertilizing principle for the support, growth and maturing the grain, which the roots are incapable of affording and extracting from a parched up earth, and the leaves and stalks from a dry, arid atmosphere. Such was the case in July and a part of August with us. Plaster acts very slowly, and almost imperceptibly, even in a drought, on argillaceous or clayey soils, until the succeeding year, when it develops its beneficial effects on clover and other grasses. Plaster does its duty most effectually on all silicious compositions, on sandy, gravelly, and on all soils composed more or less of sand.

On a hasty perusal, a few days since, of the last June number of the Cultivator, I observed a well written production on the subject of lime and plaster as manures, by William Penn Kinzer, of Lancaster Co. Penn. It would require too much space in your useful journal to answer all his objections to the power and effect of plaster. I will answer a few of them as briefly as possible. Mr. Kinzer sowed a small portion of his wheat field with plaster in April, but derived no benefit from it: he says nothing on the subject of the state of the atmosphere or condition of the earth. Plaster affords but little benefit on a well conditioned calcareous soil, which he represents his to be, where a sufficient degree of warmth and moisture prevail, for it is only in their absence that it acts efficiently, even on silicious compositions. He found great benefit, however, from its use with lime. On that point he is unquestionably correct. While the lime acts as a stimulus and fertilizer, neutralizing all the noxious and acidifying principles, and promoting their decomposition, the plaster attracts the requisite moisture for a full development of the power and influence of the lime. Thus positive assertions are sometimes made, condemning in unequivocal terms the power and effect of an agent, without taking into consideration its peculiar nature or composition, deterring others unacquainted with its peculiarly specific and almost exclusive properties, from a trial of its virtues, to the great injury of the public, as well as individual loss. I would refer the reader to Mr. Kinzer's observations on the subject.

JOHN G. GEBHARD.

Claverack, Sept. 21st, 1838.

Live Fences of the Willow.

White-Hall, Va. 27th Sept. 1838.

JUDGE BUEL—Dear Sir—I do not recollect to have seen any thing said in regard to live fences made out of yellow willow: if any thing in the following is worthy your notice, or likely to be of advantage to the numerous readers of your excellent paper you may use it to the best advantage. In our region, say the counties of Frederick, Clark, Warren, Page and Shenandoah, there are many miles of live fence, especially upon the banks of the North and South branches of the Potomack river, made of the branches of the yellow willow. In the month of March they are cut down and trimmed with an axe, say eight or nine feet long, so that cattle cannot well reach the tops and trim them, in which case they do not live well: however they are planted at most all seasons of the year, though the spring is preferable; all sizes are planted, as near the edge of the water as possible, in the spring: at other seasons, when the waters are low, we do not plant so close. About the size of a man's wrist is the best size to live well, but they are often much larger, as well as smaller, and do well: they are generally planted three or four feet apart, the large end of the limb, branch or plant being cut sharp, ready to force in the ground, which is done by means of a Jackson, (as some call it,) made of tough oak, gum or locust, to drive in the ground, say eighteen inches or two feet: this Jackson, as it is called, has a pin through the top, an inch and a fourth or half thick, to draw the Jackson, and an iron socket at the bottom. It is best, perhaps, to have several sizes to suit the limbs. After the Jackson has been drawn, the plants pushed down in the hole firm, two or three hands will make a long string of fence in a day by having two good mauls: the hole is made in less than a minute. After the willows are set it is best to plat in brush of some kind; if you do not, and water should get high soon after planting, they will not stand so well; and another advantage in platting in brush is, sediment and trash settle in behind the willows, make them stand firm, and grow more rapidly. However, some few plant and leave them several years, then cut off the tops and plat the fence, which is not a good plan. A live fence in this way is ready for use as soon as it is platted. We have taken a great many rails and fire wood off of those fences when they get ten or a dozen years old, the growth on water is so quick.

I remain, dear sir, your most obed't servant,

SAM'L M. SPINGLES.

Siberian vs. Italian Spring Wheat.

Utica, September 25, 1838.

MY DEAR SIR—The interest which I feel in relation to agriculture has not abated; nor have I suffered my attention to, or observations upon, the wheat crop to be arrested or diverted by the ill-natured remarks which have been elicited from individuals in Oneida county, where so much Italian seed wheat has been sold. I last year gave the public my experience in regard to the Siberian variety of spring wheat; and I further did that which was not only my privilege but my duty to do, in comparing my own Siberian with the Italian which was cultivated on three farms adjoining my own; which were all the pieces of the kind within my knowledge. Whenever public feeling is to be awakened to this or to any other important object, it is to be expected that the more sordid and bubbling passions will foam over first; but you may rest assured, sir, that more rational feelings, with operative effects, have also been excited: in common with may others I have myself been induced to test the comparative merits of the two varieties. I took much pains to obtain from Rome a fine sample of Italian seed, which, with my own Siberian, I subjected to the following culture:

I had two pieces of ground, of what I considered equal quality as to soil and adaptation to wheat—the one was last year cultivated to peas, with about twenty loads of manure (recent) to the acre; the other was in Siberian wheat, after corn, without manure—the pea ground I considered of the best promise. I concluded to give this lot to the Italian wheat, and give the Siberian the trifling advantage of sowing first as to time upon the other—thus with the like preparation on both, of ground and seed, the two kinds were sowed the first week in May: both grew well—the Siberian was first fit for harvesting—both cut and secured in fine weather—the straw of the Siberian bright and silvery, and berry plump and full—the straw of the Italian lacked lustre and was somewhat rusty, insomuch that the kernel was so shrunk that it will injure both its sale and its price in market.

In my former communication I claimed for the Siberian variety of spring wheat its ability to withstand both rust and smut, to a greater degree than any other kind with which I was acquainted. My

experience of the past season sustains its superiority, so far as a single experiment goes, but I do hope that through the medium of your invaluable paper the agricultural public will be furnished with sufficient data to form a correct opinion on this deeply interesting subject. With a market commanding two dollars a bushel for the best of wheat, and ten dollars a barrel for best of flour, shall it be considered obtrusive to urge the wheat crop upon the farmers' notice? Shall I be contradicted when I say that rust and smut have been for nearly half a century the greatest enemies of the wheat crop? And will you impeach my motives (whilst you have not distrusted my statement,) when I tell you that in my four years' experience it has resisted both perfectly? Far be it from me to consider the question as having been settled by the experience of any one individual for a few seasons, but in the absence of other and better testimony let it have its due weight. Respectfully yours,

THOMAS GOODSELL.

The ears are not well filled this season, in either the Siberian or Italian. As we have not thrashed, I am unable to say what will be the comparative yield per shock, or per acre.

Italian and Siberian Wheat—Dutton Corn.

Harmony, August 14th, 1838.

DEAR SIR—I procured from Oneida county the Italian and Siberian wheat: the Italian did the best. This season, I procured the early yellow Dutton corn, a sufficient quantity to plant three acres: it proves to be the earliest, and most beautiful corn I ever saw. I have raised 150 bushels for seed, which, I think, will be insufficient to supply the wants in this vicinity. Yours truly,

EDMUND WELLS.

A Profitable Mixed Crop.

Middletown, Monmouth Co. N. J. Oct. 11.

Mr. BUEL—Excuse me for troubling you with a few questions. Is the smut on maize of the same nature and habit as the smut on wheat? Does the smut adhere to the grain, and being absorbed by the plant, and circulating through the sap, produce the disease? And do you think the same steeps, used successfully for wheat, will destroy the smut on seed corn? I have been in the habit of selecting seed corn whilst gathering, and leaving some husk on, and tying it for a mark, and throwing it in the wagon with the others, and assorting it at the crib. Some of the smutty corn being thrown in the wagon likewise, impregnates all my seed corn.

I have been in the habit of using fish as a manure, with advantage. Now I have heard it asserted that in New-England, where they have used them many years, they have at length rendered the land barren and unproductive. Some intelligent men with whom I have conversed on the subject, think it not improbable that by the continued use of them, the ground becomes saturated with oil and forms an indecomposable substance, similar to oil paints. What is your opinion in regard to it? Will some of your readers, who know any of the facts in regard to their long continued use, publish that knowledge through your columns? By so doing they will oblige me and others of your readers.

I have some land that I wish to under-drain: but at the depth of eighteen inches it is, in many places, a loose quicksand. Will not the quicksand fill up the drain? How will slabs do for under-drains? Will they rot very fast where they are continually wet?

I have been successful in raising a large crop from a small piece of ground; perhaps it may be useful to state the circumstances. Watermelons having been an uncertain crop, for several seasons past, I determined last spring to plant potatoes amongst mine, so as to be sure of part of a crop. I struck it out both ways eight feet apart for melons, and then split the intermediate spaces both ways for potatoes, (making the hills four feet apart,) which I planted early, putting one large shovel full of manure in the potato hills, and three in the melon hills, and afterwards put three fish to a hill. The drought hurt the potatoes, but benefitted the melons. The piece contained three acres, and produced as follows, viz:

The watermelons,	47 loads, sold for	$352 25
potatoes,	207 loads, sold for	120 37
	3)472 62	
Total per acre,.....		157 54

From your constant reader,

THOMAS ROBERTS, Jr.

REMARKS—We have not made any observations in regard to the smut in Indian corn—nor seen any remarks of others; and of course do not feel qualified to answer the inquiries of our correspondent in this matter. Quicksand is a serious obstacle to encounter in draining; yet this obstacle, we think, may be overcome, where there is a moderate descent, and a continued run of water, by covering the drain well with soda or straw. Slabs are a worthless material for drains. The suggestion that the use of fish, in manuring lands, ultimately impoverishes them, is new to us; and if such be the case, which we very much question, it must be by accelerating the decomposition and exhaustion of the vegetable matter in the soil. The decay of the latter, particularly when fibrous or woody, is slow; but when brought in contact with animal matter, as fish, which ferments rapidly, its decomposition may be greatly accelerated. But even in this case, nothing would seem to be lost, as the first crops gain what the later ones lose.—*Cond Cult.*

The Crops.

Black-Rock, Sept. 16, 1838.

After all, our boasted wheat crop in west New-York is a small affair. I am told, on threshing, our farmers have not more than half the quantity they expected at harvest. And although the Ohio and Michigan crop is good, it will be so late to market, that flour will be high through the season. Indeed, pretty much all the mills of the country, excepting those at Black Rock [and at Oswego and Rochester] are dry. These cannot fail so long as Lake Erie holds out. The drought with us is terrible. No rain for several weeks; and indeed only half a dozen light showers since the 1st of June. How the country stands it so well I don't know; yet cattle look well, although the pastures are dry and perfectly parched up. Many of our meadows have been burnt over. Oats are light; potatoes not half a crop—turnips nothing; sugar beets and carrots good. Ruta bagas cannot be depended on—they are so subject to fly and insects—wet seasons only do for them with us. Hay was a good crop. I fear our cattle will go into winter quarters poor. And if the drought continues, it will be very difficult to plough for a large wheat sowing this fall, so hard and dry is the ground. L. F. A.

Chinese Corn.

Hallet's Cove, L. I. Sept. 21, 1838.

Mr. JESSE BUEL—Sir—I send you four ears of the *Chinese tall prolific or tree corn* (a few grains of which were found in a box of tea some three years ago,) which was given me by a gentleman. It is a new variety, as it strikes off in branches from the stalk, hence its name "*Tree Corn*;" sometimes four, but seldom less than three branches, and bearing an ear at the end of each branch. It grows from eight to ten feet high, produces abundance of fodder, and is a large white flint twelve rowed corn—ears from ten to fourteen inches long. I counted six hundred and sixty grains on some ears. I planted this corn on the 10th of May; it had ears fit for boiling the 10th of July; its produce was much curtailed by the long drought—but notwithstanding, I counted *two thousand one hundred and twenty grains*, the produce of *one stalk*, being upward of two thousand fold. The Dutton, (which is an excellent corn) planted on the same day, on the same field, and received the same quantity of manure, cross-ploughing and hoeing, did not produce one-half: my patch about two hundred hills was examined by Mr. A. Polhemus of Hurlgate-farm, and many more of our neighbors, who all agree that it was something new, and something very superior.

This corn is for sale at the store of G. C. Thorburn, 11 John-street, New-York, and at William Thorburn's, North Market-street, Albany: the price is 25 cents an ear. One ear will plant *one hundred hills*. Now if there is a farmer between Maine and the Rocky-mountains, who would rather give two shillings for two gills of brandy, in preference of his being put in possession of seed for one hundred hills of such corn—he deserves to be fed on suppaan and butter-milk, as long as his little soul and big carcass will hang together. Yours,

GRANT THORBURN.

We received the four ears of corn accompanying the above letter, and thank our old friend for the compliment; we hope this new variety may realize his most sanguine expectations. —*Cond. Cult.*

Common School Libraries.

New-Rochelle, Sept. 26, 1838.

J. BUEL, Esq.—Dear Sir—I have just seen the August No. of the Cultivator, and am gratified to notice that you advocate the formation of agricultural schools, and adoption of measures by government to advance the science, and give additional interest to the practical pursuit of this interesting occupation, by better acquaintance with the theory. You do not over-estimate the subject, and I trust the day is not distant when state authorities will bestow attention upon it, and adopt such measures as shall tend to make us an agricultural as well as a commercial and manufacturing people. Then shall we begin to realize the blessings with which a beneficent Providnece has surrounded us in the diversified soil and climate of our favored country.

But the more particular object I have in this communication is, to correct the impressions you entertain in relation to the school library, recently issued under the direction of the American society for the diffusion of useful knowledge. It is admitted that the fifty volumes do not embrace all the topics of general interest, that the committee were desirous they should; and which in their published prospectus they designed to introduce; but the repeated calls upon them "as stated in the introduction to each volume, induced them to issue a selection from existing publications, while they go on *as fast as possible* to complete the plan."

You will understand from the accompanying documents, the general objects of the society, and how prominent a place the subject of agriculture had in the proposed library for schools, independent of one designed to be issued expressly for the farmer whenever the committee shall receive the necessary materials, prepared and adapted to the genius and character of our own country, by practical and scientific men. The difficulties under which the committee have labored can well be compared to the magnitude of the undertaking. At a time when all our citizens were engrossed in their own occupations, and when few had sufficient resources to meet their daily engagements, the committee have gone on with their work, without seeking the pecuniary assistance of the community, and have prepared, principally of standard works, a library for our schools, which has found favor wherever it has been examined, and which I think must commend itself to you. Even when those books shall be included, which the committee promise to add when materials shall be found, and their means be sufficient, the present selection ought to have a place in the library. You are aware of the time, labor and means necessary to prepare a set of books on any given subject, properly adapted to a specific object. How difficult then must be the task of preparing a systematic series of books on agriculture, suited to our soil and climate, when the subject, as you admit, has been so much neglected? Must we, therefore, withhold all aliment from the minds now maturing in our common schools?

The committee do not pretend that the library is by any means complete, but that it is in itself unobjectionable. The undertaking is one of national importance, in which you and other philanthropists may engage, and by a united and wide spread co-operation make this library as comprehensive and useful to the rising population, as the territory over which they wish it to diffuse an influence, is vast and extensive.

A WESTCHESTER FARMER.

Making and Fining Cider.

Ballston, September 20, 1838.

DEAR SIR—Agreeable to my promise, I send you an account of my process of making cider.

I grind my apples after they have become mellow, carefully throwing out all that are defective. I stir up my pomace till it becomes red from the action of the air; then press out the juice slowly—put it in casks—bung it up—and immediately place it in the cellar. Before the fermentation commences, I insert a flexible tube (lead pipe I have used) through the bung, and bend the other end into a cup of water or cider placed on the cask near the bung, to allow the carbonic acid gas to escape, and to prevent the oxygen of the air from decomposing the saccharine matter. So soon as the gas ceases bubbling through the cup, the fermentation has ceased; it is then drawn off into clean casks, bunged tight and placed in a cool dark cellar, where it will continue sweet for any length of time. The advantage of this process is, that you preserve the juice perfectly sweet, and you are more sure to draw it off at the right moment after fermentation has ceased. I place it in the cellar to ferment, because the temperature is more uniform, and it is not so liable to be agitated by sudden gusts of air or disturbed by other causes. When fermenting, the lighter particles of pomace are rising, the more heavy settling; and the least touch of the cask will disturb the operation. I use *no ingredient whatever* to make my cider good or to preserve it; and I almost invariably have it of the purest and best quality. Yours most respectfully, W. G. VERPLANCK.

The Wheat Maggot.

New-Scotland, October 9, 1838.

J. BUEL, Esq.—Sir—In the October number of the Cultivator you ask for information respecting an insect or worm, which preys upon the wheat crop after it has ripened. I will describe a destroyer which I have seen, which may or may not be the one you allude to. I had five acres of winter wheat on a dry gravelly soil in the summer of 1832, and a few days previous to cutting it, I rubbed in my hand one of the heads, and among the kernels I discovered a greyish worm, about one-eighth of an inch in length, and about the thickness of a cambric needle: it appeared brisk and active, and,

like the caterpillar, upon being touched coiled itself immediately up. It resembled a species of grub, though I saw nothing upon it in the form of legs; on examining the kernels in my hand, I found two-thirds of them punctured as with a small needle; the heart mostly eaten out, and they were easily rubbed fine. I looked still farther but saw nothing more of the worm or its work. In the autumn following, when preparing some of the above mentioned wheat for seed, by immersing it in strong pickle, I was not a little surprised to see apparently full and plump kernels, float on the surface, which, on examination, proved to be entirely eaten up, save the shells; and in most of them a small hole was clearly seen. From every two bushels thus immersed, about one quart floated from the above cause.

My wheat the next year was mostly destroyed by the weevil, [grain worm] so I saw nothing of this maggot, as the weevil destroys the grain while in the milky state.

I purchased half a bushel of Italian spring wheat last winter, from Mr. Van Rensselaer, at the Cultivator office, and on the 28th of May last, it was sown; having prepared it by immersion in a strong pickle, and then mixing with it as much quick-lime as could be made to adhere to the grain. It came up well and grew finely, wholly free from weevil, rust or smut. But behold! a few days previous to cutting it, I discovered one, and only one, of the same species of little grey worms. Just three months from the day it was sown, it was threshed, and yielded about as ten from one. The soil is not a right one for wheat, being too gravelly; and was shaded by woods on the north, south and west.

Before I lay down my pen, I must just remark, with regard to pickling and liming seed grain, that I believe it should be strictly adhered to, as I have practised it upon all kinds of grain, except peas and buckwheat, and can speak of its benefits to every kind. Yours with respect,

W. MURPHY.

Rohan Potato.

Oxford, Ct. Oct. 1, 1838.

DEAR SIR—I planted, on the 26th of April last, two tubers of the Rohan potato which weighed 13 oz. on a dry loam.

I dug the crop on the 24 Sept. which measured two and a half bushels, and weighed 144 lbs. or more than 160 per cent, notwithstanding the drought. Other varieties on similar soil were not more than half an ordinary crop.

The Rohans are but little known, and will probably command a good price for a year or two; and unless some description of them is given in the Cultivator, there will probably be as many kinds palmed upon the public as there have been of Dutton corn.

My seed, which I had of your neighbor Thorburn, was of an oblong or kidney shape; but on digging the crop I found various shapes, round, kidney, and, as is generally termed, snagged.

On offering some of the kidney shaped ones for a premium at the horticultural fair at New-Haven, they were objected to by some, as not being Rohans on account of their shape. Very respectfully yours,

ALFRED HARGER.

The Grub—Ruta Baga.

Poughkeepsie, Oct. 16, 1838.

J. BUEL, Esq.—Dear Sir—Being a subscriber to the Cultivator, I take the liberty of stating to you a few facts with regard to some of my crops this season. I observed in one of the spring numbers of the Cultivator, that salt petre was a preventive for the grub worm eating corn, by making a pickle, and soaking twelve hours before planting. I did so, as per order; and planted a field of seventeen acres, and at the proper time the grubs came along, and it appears the flavor of the salt petre just suited their taste, for they cleared ten and a half acres of my corn-field almost entirely; the remaining six and a half acres, I planted some of it in three times, and have now about one-third of an average crop. I would have been better off if Mr. Grub had taken the whole, as I ploughed up the ten and a half acres and sowed three and one-fourth bushels of buckwheat, from which I have 300 bushels of very fine buckwheat, and sold it at 75 cents per bushel, and I am certain there is 50 bushels lost on the field, as it had all to be mowed, as it was all lodged and could not be cradled. Therefore I think it will take more men than ever I have seen, to convince me that salt petre will stop the grub from eating corn.

I have succeeded very well these four years in growing the ruta baga. I have had each year about 600 bushels to the acre; this season the drought and the fly injured my turnips some, but I will have an average crop still. I consider it a very valuable crop, as I have sold them at from four shillings to six shillings per bushel, and in the spring, my horses, oxen, cows, sheep, hogs, and even the poultry eat them and do well on them, and they are remarkably good for horses that have got the heaves, and also a good preventive for that disease. My method of cultivating the ruta baga is the same that is practised in Scotland. I plough the ground in April, and on the 20th of June harrow it, and cross-plough and harrow until the ground is perfectly fine. I then draw my drills with the plough two and a half feet from centre to centre; I then take a one-horse cart or wagon, but a cart is best, as the drills are injured with so many wheels turning on them; I put manure in each drill as for potatoes; then I take the plough and split the drills right and left; then I take a light roller long enough to reach over two drills, with one horse, and roll the tops of the drills once over; then I take the drill harrow and sow the seed; then I pass the roller once over the seed; when the turnips are up about two weeks, I go through with a hoe and thin them, leaving them eight inches apart, and in two weeks more, I plough between the rows; I then go through with the hoe and clean the tops of the drills of all weeds and grass and in about 3 weeks more I plough them again; then in the fall I take a scythe and cut as many tops as the stock will use in one day, and so until all the tops are used; then take a dung hook and drag out all the turnips, make pits that will hold about six loads; make the pit two feet wide and two feet deep, and build them up like a roof, the more above the ground the better, as they will not keep if they are warm; cover with a little straw to prevent the earth from going among the turnips; for each pit make three little flues for ventilators; then put on from four to five inches of earth, clapped well down with the spade. The turnips will keep better in this way than in a cellar, as a cellar is too warm.

Please excuse me for troubling you with this long story, but I have seen this crop managed in this way in Scotland, and never failed, forty years ago. I remain, dear sir, your serv't,

JOHN BODDEN.

EXTRACTS.

The Philosophy of Vegetation.

[*From the Genesee Farmer*]

Perhaps there are few subjects of so much interest to the farmer as a proper understanding of the causes and agents of vegetable nutrition. The economical application of manures, the propriety of their use, the value of a system of rotation in crops—in short the whole philosophy and practice of farming—may be said to be depening on this point. Is there but one substance in nature that constitutes the proper food of plants? or are they endowed with omnivorous powers, and capable of finding food in all things presented to them? If there is but one kind of food, what is that one?—and if there are many, what is their state when appropriated by the plants? These are a few of the subjects that enter into a consideration of the food of plants; and the opinions of writers on vegetable physiology have been as various and conflicting as the substances which chemical analysis has detected in plants have been numerous.

Some have maintained that the actual nourishment was derived from the air: some that water alone constituted the food of plants; others have asserted that the growth was owing to a single substance, and that the earths which are present in plants, as well as most of the salts, are to be considered as merely accidental, not being necessary to the formation or growth of the vegetable: the only substance which all are agreed in considering absolutely indispensable, since it is a large and apparently essential part of every plant, is carbon. If the plant derives its support from the air, then the carbonic gas which exists in it must be the source of supply: if taken into circulation by the roots, then the carbon must exist in some soluble form, since the greatest chemical skill has never been able to induce a plant to take up the minutest portion of insoluble carbon, or detect its presence as an operation of nature.

Amidst these conflicting sentiments, adverse and contradictory as they may at first seem, we think that the opinions of men of science are verging to an agreement on one or two of the most essential points; and what we consider as of quite as much consequence, these opinions very nearly coincide with the actual experience of the farmer, and give a strong support to the modern theories and practice of agriculture.

We believe that Klaproth was the first to discover and announce to the world the existence of a peculiar substance, which he considered of importance to vegetable organization from its analysis, and which, from his first finding it in the bark of the elm, he denominated ulmin. Braconnet continued the investigation commenced by Klaproth, and found there were few substances of vegetable origin in which ulmin did not exist, tracing it in considerable quantities in sawdust, starch, sugar, seeds; and indeed in nearly all plants it was present. Berzelius, the great Swedish chemist, embraced it in his researches, and extending them to the soil, found that it existed in the earth in abundance, as well as in the bark and ligneous substance of trees. From its presence in the earth, and the probability that it was from thence that plants derived it, Berzelius distinguished it by the name of *geine*, a word derived from the Greek word signifying the earth. Sprengel and Bouillay have discovered that it is a leading and efficient principle in vegetable and animal manures, and hence they have denominated it *humine*, a name by which it has been most generally known, though scientific men are appearing to incline to return to the nomenclature of Berzelius. The justly celebrated chemist and observer, Raspail, in his late work on Organic Chemistry, translated by Dr. Henderson, denies the existence of *geine*, or *humine* as a proximate principle in soils, and says, "it will be easy to see that all these phenomena, (described by Berzelius, Sprengel and others,) apparently so varied, which have given room for the discovery of so many substances analagous to ulmin in their nature, are essentially nothing but a development of carbon." The name, however, we consider of mere secondary importance, and whether it is called *ulmin*, or *humine*, or *geine*, or *carbon*, it cannot effect the results which seem to flow from the substance and render it one of the most important agents in vegetable nutrition, if not the only one yet known.

Geine, says Professor Hitchcock, in his late admirable Report on the Economical Geology of Massachusetts, "when wet, is a gelatinous mass, which on drying, becomes of a deep brown, or almost black colour, without taste or smell, and almost insoluble in water; and, therefore, in this state, incapable of being absorbed by the roots of plants. Yet after the action of alkalis upon it, it assumes the character of an acid, and unites with ammonia, potassa, lime, alumina, &c. and forms a class of bodies called *geate*, most of which are soluble in water, and therefore capable of being taken up by the plants; and it is in the state of *geates* that this substance, for the most part, exists in soils."

Silica, alumina, lime, magnesia, oxide of iron, potash, soda, and sulphuric and phosphoric acids, may be considered the inorganic principles of vegetables, and analysis detects their presence in the most of them; hence they will be found the constituents of all soils, for the most part existing as salts—for instance, carbonate of lime, sulphate of lime, muriate of lime, phosphate of lime, &c. Neither the earths nor the salts can be considered the proper food of plants, as both these may be present, and yet a weak or imperfect vegetation, or none at all, be the result. But if the combination of these salts with humus or geine has taken place, then, in connexion with the earths, vegetation will be vigorous, and the proper functions of plants fully developed. In the language of Dr. Dana, it would seem then "that the earths are the plates, the salts the seasoning, the geine the food of plants."

The 'Soluble Vegetable Extract,' of Davy and Chaptal, produced from carbonaceous mould, is the soluble *geine* of Berzelius, and the insoluble matter of the mold spoken of by Chaptal would seem to be the insoluble geine or humus of Berzelius and Sprengel. Geine is, therefore, the decomposed organic matter in the soil. When the result of recent decomposition, it is abundantly soluble in water; the action of the atmosphere converts this soluble matter into solid humus or geine, 'still partially soluble in water, and wholly soluble in alkali.' Soluble geine, and in this state only does it become the food of plants, acts neither as acid nor alkali. It is converted into a substance having acid properties by the action of alkali, and in this state combines with earths, alkalies and oxides, forming neutral salts, soluble in water, such as magnesia, lime, &c. and thus matter insoluble of itself is prepared for the food and nutrition of plants. It appears to have been satisfactorily established by late chemical researches, that this substance forms the nourishing basis of all soils, and that they are fertile or infertile exactly in proportion to the soluble geine they contain, or the application of materials capable of converting the insoluble into that which is soluble.

If there are any facts certain in agriculture, it is, that a soil composed chiefly of one of the earths, either sand, lime, or clay; or one that contains an excess of salts, as pure manures; are always barren. Plants may indeed exist to a limited extent, but they will be weak and without fruit. To these earths add geine, and a perfect healthy vegetation will be the result. The great essentials of vegetation, then, are the earths, salts, and geine, and their degree of fertility will mainly depend on the proportion with which the last is mixed with the first.

Every discovery in experimental philosophy—every advance in vegetable chemistry, seems to render more clear the great truth, that nature's works, though apparently complex, are carried on in the simplest manner, and with the fewest possible agents. The slight shades of difference found to exist in the constituents of most dissimilar substances, such as starch, lignin, sugar, and some of the acids, prove that slight causes produce powerful modifications of matter, and render it probable that the original kinds of matter are less numerous than have been usually supposed. All investigations point to an agency that pervades all the forms of matter, and by an arrangement of atoms consequent on vitality produces all the varied forms of vegetable and animal nature. This agent, under the name of caloric, galvanism, or electro magnetism, is constantly at work modifying, changing, combining, decomposing and arranging. To it we owe aggregation and cohesion—to its subtile and diffusive energy, all growth and circulation—and may it not be considered as certain that the earths and salts are a magnificent voltaic battery, ever ready for action when moistened with water, and thus reviving the dormant vitality of the seeds submitted to its influence. But though this vitality may be revived, and the slumbering energy of this germ of the future vegetable be restored to activity, it is clear that the circulation will produce little or no effects in inducing growth, unless matter sui-

table for absorption and after-deposition, is provided for the newly awakened energies and action. This is furnished by geine, and is presented in a state the most suitable for the circulating juices of the plant. Taken up by the roots, or absorbed from the air, it is converted into lignin or woody substance by deposition and æration, and thus becomes a new plant, prepared to run its course of growth, maturity and decay.

Taking this simple, and we think philosophical view of the subject, the reasons of many farming processes, hitherto but little understood, are made more plain; and various improvements suggested and made practicable. If a soil on analysis contains an undue proportion of any one of the earths, the evil can be remedied by combining them in the proper manner, by adding what is deficient until the balance is restored. But the fact, that the earths themselves, uncombined with salts or geine, are never fertile, and that all the combinations of which they are capable, can never be made to support vegetation, should not be lost sight of. Some soils, from the proportion of the earths found in them, are more friable and easier to work than others; and some combinations are proved to be more suitable for the union with salts necessary to the excitement of voltaic or galvanic agency and the consequent vitality and circulation of plants; but alone, no possible modification or combination can make what is called a fertile soil. Were we to name for comparison the agents and the several parts they perform in the process of vegetation, we would call the *earths* the plates of the galvanic battery, inert while dry, or not subjected to exciting causes; the salts by their solubility furnishing the acids, such as carbonic, sulphuric, phosphoric, necessary to rouse the battery to action; and when this is done, humus or geine offers the only matter that can be taken into circulation and constitute (properly speaking) the food of plants.

According to the modern investigations of science, every particle of matter is pervaded by this universal agent, and requires only the aid of moisture to its greater or less development; the intervention of the fluid serving as a conducting power between the several particles. Pure water is the weakest exciting power yet known, but at the same time the most durable. This is beautifully exemplified in the experiments of Mr. Crosse, who uses only water for the exciting power of his batteries when he requires their uninterrupted action for weeks or months, the slow continued excitement being more favorable to the development of animal life, or metallic or mineral crystallization, than one more powerful, but of shorter duration. This action of water shows why water alone, applied to the earths and through them to vegetables, has so feeble and tedious an operation on their development. On the contrary, if the acids are supplied, and this is done in a multitude of ways, the action becomes at once vigorous; and connected with a proper supply of food, vegetation will be rapid and abundant.

This theory of vegetable nutrition explains, in our opinion, far more satisfactorily than any other, the mode in which manures, vegetable, animal and mineral, produce their effect on vegetation, and stimulate its growth. According to Chaptal, the different substances afforded by animals, and useful as manure, including all their secretions, are, "gelatine, fibrine, mucus, fat, albumen, urea, uric and phosphoric acids, and some of the muriates or salts." Here, it will be seen at a glance, are a multitude of exciting and nutritive causes mingled, and when combined, as animal manures usually are, with vegetables decomposed, the available geine is considerably increased. The liquid manures found so powerful in Flanders, and the use of which is such a marked feature of the excellent Flemish husbandry, are, it is well known, mostly composed of the urine of animals. The analysis of urine by Mr. Brandt discloses the cause of this efficiency.

Water,	65
Phosphate of lime,	5
Muriate of Potash and ammonia,	15
Sulphate of Potash,	6
Carbonate of Potash and ammonia,	4
Urea,	5
	100

A more active combination could scarcely have been devised than this analysis shows such manures to be; and though Fourcroy and Berzelius slightly vary the constituents, their analysis does not materially alter or impair its efficiency. Of the above animal ingredients, we will select but one to illustrate our theory, as it is one respecting the efficiency of which as a manure there can be no doubt, and which is daily coming into more general use—we allude to phosphate of lime or bone dust.

Bones, as a whole, contain about equal quantities of phosphate and gelatine. The harder and more compact the bone, the greater the amount of phosphate, and the less the proportion of gelatine. The bones of the ox contain from 50 to 55 per cent. of gelatine; those of the horse only from 36 to 40; those of the hog from 48 to 50; and the bones of the legs and feet of the deer, elk, roebuck, and hare, give an analysis from 80 to 90 per cent of phosphate. All the roots, such as beets, carrots, &c. and the grains, such as wheat, corn, &c. contain considerable quantities of this phosphate; and its presence would seem to be of much importance in the vegetable and animal economy. When bone dust is deposited in the ground, it speedily undergoes decomposition, and the principal ingredients in its composition are set at liberty to form new combinations, and perform a new part in the great circle of nature's revolutions. The phosphoric acid leaves the lime, and as in all its forms of existence it is one of the most exciting agents, its application to the earths is almost as immediate as the dip of the chemist's plates into the galvanic trough. The lime set free is, by the absence of the neutralizing acid, perfectly caustic, and seizing at once on whatever geine is found in the soil renders it soluble, and thus fit for immediate use by the plants while in their excited state of action. Can it be wondered at then, that bone dust should be efficacious, or that its effect on vegetation should be almost instantaneous? It may be further remarked, that bone dust applied to very dry or very wet land, loses much of its efficiency; a reason for which may be found in the fact, that in the first instance the ordinary voltaic agent is but imperfectly supplied, and in the last, the acid is so diluted as to become but little superior to water itself.

The efficiency of carbonate of lime as it is generally applied to soils, is to be accounted for on the same principles. It differs, however, in this respect; in the phosphate the acid is set at liberty in the soil, in the carbonate it is driven off by burning. Like the phosphate, the lime is at liberty to unite with and render soluble, all the insoluble geine or vegetable matter in the soil, but unlike that it furnishes no acid to stimulate the voltaic agency to more vigorous exertions. Its effects, though certain, and most beneficial, are not so immediate as those of the phosphate. We may say, that by the application of common lime, the food of plants is *cooked* for their use; by the phosphate, it is not only cooked, but they are excited to devour it. The better the operation of lime in all its forms is understood, the more highly will it be prized and its use the more widely extended.

This theory of the nutrition of plants by voltaic agency, most happily explains the manner in which such small quantities of the salts of lime produce such astonishing effects on vegetation. Every experimental chemist knows what effect the combination of a few drops of acid with the water of his galvanic trough will have on his battery; and the application of lime to our battery of nature, when under proper circumstances, is equally effectual; —nay it does more, for the application of the acid by the chemist only excites his instrument to activity, while the lime furnished the earth by the farmer not only excites the action, but furnishes the material upon which that action can profitably be exerted. All persons acquainted with the use of lime are agreed that it produces little or no effect, except by mechanical division, only on lands that contain animal or vegetable matter that requires decomposition, a decisive proof that lime of itself does not constitute the food of the plant. But let a soil deficient in lime, and containing the food of plants, be furnished with the smallest quantity, and, unless rendered inactive by perfect dryness, or excessive moisture, its effects will be observable at once. Even the small quantity that adheres to wheat, when steeped and rolled in lime, produces a sensible effect on the vigor and rapidity of the shoot. So too with the sulphate of lime, which, at the rate of only one or two bushels an acre, produces such an effect on many kinds of vegetation.

If our notions of vegetable nutrition are correct, all soils will be fertile that contain lime, and geine or humus; and the object of the analysis of soils will be directed to the determination of these two points. The sand and the clay present in any soil can be known without difficulty. Every farmer knows whether his soil is adhesive, retentive of moisture, or, in other words, convertible into mortar by moisture and the operations of agriculture; or whether it is dry, porous, easily parting with water, and liable to leach; and he knows too that a combination of these soils will materially benefit, and remedy the evils of both. But he has not hitherto been able to determine the best applications to give fertility to his soil, or ascertain whether the defect was the want of lime or vegetable matter; and the methods of analysis proposed by Davy, Chaptal, Beck, and others, are too complicated and nice for his purpose.

This difficulty we imagine is now in a great measure overcome, and a method of analysis discovered, by which any farmer, with little time and expense, may determine the quantity of vegetable nutriment that exists in his soils, whether it is soluble or insoluble, and whether lime is present, or requires to be applied to promote decomposition and vegetation. Dr. Dana of Massachusetts, who has long been occupied in chemical investigations, connected with manufactures and agriculture, has lately given the following directions for ascertaining the geine in the soil, and the lime. It will be seen the process is very simple, and can scarcely fail of being effectual.—We quote from Prof. Hitchcock's Report:

"1. Sift the soil through a fine sieve. Take the fine part, and bake it just up to browning paper.

"2. Boil 100 grains of the baked soils, with 50 grains of pearlashes, saleratus, or carbonate of soda in 4 ounces of water, for half an hour; let it settle; decant the clear; wash the grounds with four ounces of boiling water;—throw all on a weighed filter previously dried; wash till colourless water returns. Mix all these liquors. It is a brown solution of all the soluble geine. All the sulphates have been converted into carbonates, and with all the phosphates are on the filter. Dry that, therefore, with its contents at the same heat as before. Weigh—the loss is *soluble geine*."

For the lime:

"Replace on a funnel the filter and its earthy contents; wash with 2 drams of muriatic acid diluted with 3 times its bulk of cold water. Wash till tasteless. The carbonate and phosphate of lime will be dissolved, the alumina scarcely touched. We may estimate all as salts of lime. Evaporate the muriatic solution to dryness, weigh, and dissolve in boiling water. The insoluble part will be phosphate of lime. Weigh again—the loss is sulphate of lime."

To ascertain whether the residuum contains *insoluble geine:*

"Test it by burning a small quantity on a hot shovel—if the odor of burning peat is given off, the presence of insoluble geine is indicated. *Calcine* and filter. The loss in weight will give the insoluble geine."

Science of Gardening.—*Continued.*

[*From the Alphabet of Gardening.*]

GARDEN PHYSICS.

The first topic to which I request attention under this head, is the direction in which plants and their several parts, naturally grow; a thing of important consideration in all the varieties of training, as much injury may be done by opposing natural laws, while much benefit may accrue from turning these artificially to advantage.

DIRECTION OF PLANTS.

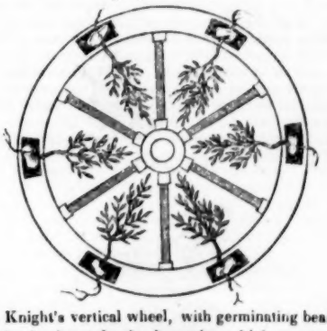
On going up a steep hill, we find ourselves forced to stoop forwards by an invisible force, as if it were pulling the body down to the slope. It is this force which causes a stone thrown up in the air to fall down again, and which causes a soap bubble and a balloon to rise up above the ground by pulling down from above them the heavier air, which, being very moveable, will not rest on the top of a light body, any more (and for the same reason) than a sheet of water would rest on the top of a cork.

It is inferred from certain ingenious experiments, that it is this same force which causes most plants to grow upright with their roots more or less perpendicular to the stem. Dobereiner, a celebrated German writer, proved by experiments, that the same species of plants will rise higher in condensed than in rarified air, and hence, on high mountains, trees become dwarfish; a circumstance also in part caused by the light being there more bright and intense.

On the supposition, that the roots of plants descend into the soil either from their dislike to light, or their natural propensity to extend themselves in search of nourishment, Dr. Grew, and recently M. Dutrochet, found, that when kidney beans were placed in a suspended box, with air above them, and holes below to admit light, they sent their roots down through the holes into the light, and not into the earth in the box.

M. Dutrochet also repeated the ingenious experiment of Mr. T. A. Knight, of planting kidney beans in moistened moss, and placing them on wheels, revolving both vertically and horizontally, by a shaft from a water mill. The beans germinated well, and the result was curious. The vertical wheel, which went at the rate of 150 turns in a minute, caused all the roots to point outwards, precisely in the direction of the spokes of the wheel, while the stems pointed as invariably towards the centre, where, in the end, they all met.

[Fig. No. 56]



Mr. Knight's vertical wheel, with germinating beans.

On the horizontal wheel, again, which went at the rate of 250 turns in the minute, the roots, instead of running directly downwards, as they would have done if at rest, pointed in a slanting direction outwards, while the stems pointed aslant inwards, forming a cone at some distance above the centre.

[Fig. No. 57.]

Mr. Knight's horizontal wheel, with germinating beans.

Lord Kames mentions a plane tree growing on the high wall of a ruin, which sent a root down along the wall to the ground; a circumstance easily accounted for on the same principle, though it has been adduced as a proof of instinct, if not of reason, in the tree itself.

From these facts, it is evident that the number of tall plants, such as Jerusalem artichokes, on a particular piece of ground, cannot be increased, as some have fancied, by making the surface irregular; nor can more

trees rise on a small hill than on a spot equal to its base, though this will not apply to strawberries, New-Zealand spinach, and other creeping or spreading plants.

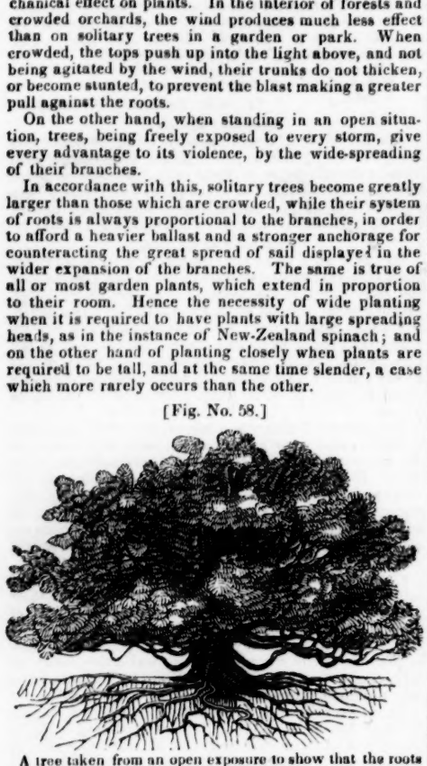
EXPOSURE AND SHELTER.

The degree of light, and of exposure, has a great mechanical effect on plants. In the interior of forests and crowded orchards, the wind produces much less effect than on solitary trees in a garden or park. When crowded, the tops push up into the light above, and not being agitated by the wind, their trunks do not thicken, or become stunted, to prevent the blast making a greater pull against the roots.

On the other hand, when standing in an open situation, trees, being freely exposed to every storm, give every advantage to its violence, by the wide-spreading of their branches.

In accordance with this, solitary trees become greatly larger than those which are crowded, while their system of roots is always proportional to the branches, in order to afford a heavier ballast and a stronger anchorage for counteracting the great spread of sail displayed in the wider expansion of the branches. The same is true of all or most garden plants, which extend in proportion to their room. Hence the necessity of wide planting when it is required to have plants with large spreading heads, as in the instance of New-Zealand spinach; and on the other hand of planting closely when plants are required to be tall, and at the same time slender, a case which more rarely occurs than the other.

[Fig. No. 58.]



A tree taken from an open exposure to show that the roots spread out proportionally with the branches.

Recent writers on botany have endeavored to show that the tapering tuber of the carrot, the beet, and other simpler plants, are not properly roots, or at least that they have more the characteristics of stems than of roots; in other words, as every plant grows in two directions, one downwards, the other upwards, the spindle-formed tuber of the carrot is alleged to belong to the upper or ascending portion of the plant, rather than to the downward or descending portion. Independent of structure, however, this would appear to be equally rational as to allege that a man's feet belong to the upper portion of his body, but it appears to be correct enough to say that the partly horizontal portions of the iris, though under ground, are not roots but stems; and it must be very obvious that the creeping runners of strawberries are not stems.

[Fig. No. 59.]

A tree taken from a crowded plantation to show that the roots are equally small with the branches.

Weak stems which cannot rise high in a perpendicular direction by their own rigidity, are furnished with several means for effecting this. Some straggle up irregularly amongst other thick-growing plants, as the bramble and bitter-sweet; others, like the hop, the kidney-bean and convolvulus, twine closely around others stronger than themselves, and when they cannot meet with such, several shoots will twine around each other, to give mutual support.

It is important to remark, that different species, in twining for support, follow different laws, one going from right to left, of which there are twenty genera, and another from left to right, of which there are ten genera. A hop-plant, for instance, directs its course round a pole with the sun; but if untwisted and forced to take an opposite direction, it will injure or perhaps kill it.—If a honey-suckle do not meet with support, it twists into a spiral from right to left. It is of importance to attend to these circumstances in training.

MECHANICAL TEXTURE OF SOILS.

Though it has been stated above, that the roots, at least of trees, are generally proportional in extent to the branches, this must be taken with some limitation, inasmuch as it will in part depend upon the texture of the soil. The perpendicular extent of roots, for example, is greatly influenced by the looseness or compactness of the soil; and hence Du Hamel found the tap-root of an oak, which had been sown in a rich deep soil, to be four feet in length, while the stem rose only six inches high. Carrots and similar deep penetrating roots, when they meet with a stiff soil, not easily divisible, are not only dwarfed, but split into branches or twisted into a spiral. When certain roots, also, such as those of timothy grass, are planted in the moist soil natural to the plant, they are fibrous; but when on the top of a dry wall, they become tuberculated; for the purpose, it would appear, of laying up a store of nourishment in case of accidental drought. An alder root was found amongst gravel, marked all over with the contour of small stones.

Since then the mere texture of a soil, independently of the food of plants which it contains, produces such remarkable effects, it must be of great importance for the gardener to attend to this circumstance.

CIRCULATION OF WATER IN SOILS.

It is no less necessary for the due nourishment of plants, that the water by which soils are moistened have a proper movement or circulation, than it is for the animal food, when digested, to pass through the stomach and have a proper movement through the bowels. In the case of the animal, when this movement in the bowels is too rapid, as in cholera, the food is hurried off before it can be conveyed into blood, and when it is too slow, as in costiveness, the mouths of the minute tubes are pressed upon and obstructed, so that the food* cannot obtain admission. It is much the same with plants, when the soil is so loose and porous as not to retain moisture, or so stiff and compact as not to allow what water it imbibes to circulate. In the latter case, indeed, plants are more precisely like animals affected with costiveness, in that the rejections of the digested food are retained so near the mouths of the nutrient vessels, as to greatly hinder their getting at the proper materials. The difference in plants arises from their having to lengthen their rootlets to get beyond the rejections thrown out, which they obviously cannot do in a stiff hard soil. Even independently of having thus to continue their roots amidst a mass of such rejections, the water, in consequence of stagnating, and of course preventing a fresh supply from above, becomes soon exhausted of the nutritive materials with which it may have at first been mixed.

This is not mere theory, as some may be apt to consider it; for it has been proved by numerous facts, that the most fertile soils are those which are so compounded so as to admit of the greatest, most minute, and most immediate distribution, diffusion and circulation of water, or rather moisture; for when water is found in such portions as to be distinguished from the soil which it moistens, this will form, in most points of view a watery and bad soil.

The chief causes of the circulation of water may be traced to the principle which makes a stream run down a slope. When rain accordingly falls on the level surface of a loose porous soil, it will sink into it; and if this, instead of being level, is sloping, the water will both sink partly into the soil, and also move slowly through it towards the bottom of the slope. If the soil is so loose to any depth as to cause this water to drain nearly all away, the first warm day will expand the water nearest the surface into vapour, and raise it into the air; and as soon as by this means the surface becomes dry, the moisture below will gradually rise, in the same way as water may be seen to rise into a bit of blotting paper, or a piece of lump sugar.

It hence becomes obvious, that though the surface soil be sufficiently porous to permit the due circulation of water both upwards and downwards, if the under soil at some little depth, (say from less than a foot to two feet or more,) be a stiff clay, a hard marl, or a level rock of any kind, the rain water, instead of circulating wholesomely, will settle there, from being out of the reach of the sun's influence to raise it; and in the case of the level rock, having no declivity to run off by. It is in such cases that draining becomes useful; or, where it can be effected, forming a gentle slope of the whole surface, which would farther operate on the circulation of the water by obtaining a more powerful influence of the sun, and thereby increasing the heat. The fancy stated in books, that the runs of earth-worms or dew-worms are important for draining off water, is without any foundation.

TESTS OF THE TEXTURE OF SOILS.

One of the best methods of ascertaining the capability of any soil, to take up and retain moisture, is that described by Mr. C. Johnson, for which purpose he employs the following apparatus.

* Technically, *Chyle*.

[Fig. No. 60.]

Analysis of soils. *a* a small lamp; *b*. a stool, with a hole in the seat for receiving *c*, a shallow tin vessel, closely covered, but having a pipe, *d*, for the escape of steam; *h*, a pair of accurate scales, such as are used by apothecaries and goldsmiths.

In order to employ this apparatus, put a small quantity of the soil to be tried upon the top of the tin vessel, in which water is kept briskly boiling for about half an hour, so as to thoroughly dry the soil by expelling its moisture. Take ten grains accurately weighed of this dried soil, and add to it, by means of a quill, a drop or two of pure water; if distilled water can be had, so much the better. Weigh the whole a second time, which will now be a few grains above ten. Take out the weight of the water from the scale, leaving in the weight of the dried soil, and suspend the beam, so that the scale *e* may rest on the lid of the tin vessel, the water in which is still kept boiling; then with a stop watch note the exact time which the added water takes to evaporate, as will be shown by the beam of the balance becoming level. Mr. C. Johnson found, that soils requiring less than twenty-five, or more than fifty minutes, to evaporate the added water, and bring the balance to a level, were always proportionately unproductive; the first, from having too much flinty sand, and consequently no texture fitted for retaining water; and the second, from having too much clay, and consequently too few interstices to allow the water to escape.

Rich soil, treated in this way, required thirty-two minutes to bring the beam to a level; chalk twenty-nine minutes, poor flinty soil, twenty-three minutes, and gypsum, only eighteen minutes.

A very fertile soil from Ormiston, Haddingtonshire, containing, in one thousand parts, more than half of finely divided materials, among which were eleven parts of limestone soil, and nine parts of vegetable principles, when dried in a similar way, gained eighteen grains in an hour, by exposure to moist air, at the heat of sixty-two degrees Fahrenheit; while 1000 parts of a barren soil, from Bagshot Heath, gained only three grains in the same time.

Mr. C. Johnson farther found that one hundred parts of burnt clay, when exposed in a dry state for three hours to air saturated with moisture at sixty eight degrees, took up twenty nine parts of water; that gypsum, in similar circumstances, took up only nine parts; and chalk only four parts.

Another method of testing the texture of soils is, by taking what is termed their specific gravity; that is comparing what they weigh in air with what they weigh in water. Sufficient accuracy for practical purposes may be obtained by drying two different soils, at an equal distance from a fire, or in an oven, at the same time, and then weighing in the air a pound of each in a thin bladder with a few holes near its top, or neck. When the weight has thus been obtained in the air, the bladder may be put into water, letting it sink low enough to permit the water to enter through the holes in the neck, in order to mix with the dried specimen of the soil. The weight in water, divided by the difference of the two weights, will be the specific gravity, and the less this is, the greater will be the capacity of the soil to take up and retain water. Muschenbroek thus found rich garden mould to be 1630 compared to 1000 of water, and Fabroni found a barren sand to be 2210 compared to 1000 of water.

Or fill a wide necked pint or quart bottle half full with water, and add the soil to be tried till the water rises to the brim. Then if the bottle can contain one pound of water, and gains half a pound additional when filled in this way, half with water and half with soil, the soil thus tried will be twice as heavy as water, and its specific gravity will be two. If it only gain a quarter of a pound, its specific gravity will only be one.

M. Giobert ascertained that a pound of fertile soil contained, of flinty sand, about 4400 grains, of clay about 600 grains, of lime about 400, besides seventy of water, and about twenty-five grains of inflammable materials, chiefly carbon. On a comparative trial of a barren soil, M. Giobert found that a pound weight contained about 3000 grains of flinty sand, about 600 grains of clay, about 400 grains of lime, and little or no inflammable materials. Mr. Grisenthwaite directs an equal portion of two soils perfectly dry, to be introduced into two tall glasses, in the midst of each of which a glass funnel has been previously placed. The soils are to be put in so as to retain, as nearly as possible, their natural state when in the ground, and are consequently not to

be too much pressed down. When this has been done, water is to be poured very gradually into each of the funnels, and it will rise up as it does in a piece of lump sugar into the dry soil, as may be seen through the glass. The more rapidly the water is seen to rise the better will be the texture of the soil.

I shall next turn the attention of the beginner to the changes which food, taken up by the spongelets, or suckers, of roots, undergoes in the different parts of the interior of the plant, a subject which is usually termed *physiology*, though the original meaning of this word is merely a "discourse or treatise on nature." As I believe the term is well understood, I shall employ it here.

A Table

For foretelling the Weather throughout all the Lunations of each year, forever.

This table and the accompanying remarks are the result of many years actual observation, the whole being constructed on a due consideration of the attraction of the sun and moon, in their several positions respecting the earth, and will, by a simple inspection, show the observer what kind of weather will most probably follow the entrance of the moon into any of its quarters, and that so near the truth as to be seldom or never found to fail.

If the new moon, first quarter, full moon, or last quarter, happens	TIME OF CHANGE.	IN SUMMER.	IN WINTER.
Between midnight and 2 in the morning,	2 and 4 morning,	Fair.	Hard frost, unless the wind be S. or W.
2 and 4 morning,	4 and 6 "	Cold, with frequent showers.	Snow and stormy.
4 and 6 "	6 and 8 "	Rain.	Rain.
6 and 8 "	8 and 10 "	Wind and rain.	Stormy.
8 and 10 "	10 and 12 "	Changeable.	Cold rain, if wind be W. Snow if E.
At 12 o'clock at noon and 2 P. M.	2 and 4 afternoon,	Frequent showers.	Cold and high wind.
Between 2 and 4 afternoon,	4 and 6 "	Very rainy.	Snow or rain.
4 and 6 "	6 and 8 "	Changeable.	Fair and mild.
6 and 8 "	8 and 10 "	Fair.	Fair.
8 and 10 "	10 and midnight,	Fair, if wind N. W.	Fair and frosty, if wind N. or N. E.
10 and midnight,	Fair.	Rainy if wind S. W.	Rain or snow if S. or S. W.
		Ditto.	Ditto.
		Fair.	Fair and frosty.

OBSERVATIONS.

1. The nearer the time of the moon's change, first quarter, full and last quarter, are to *midnight*, the fairer will the weather be during the seven days following.

2. The space for this calculation occupies from 10 at night till 2 next morning.

3. The nearer to *midday* or *noon* the phases of the moon happen, the more foul or wet weather may be expected during the next seven days.

4. The space for this calculation occupies from 10 in the forenoon to 2 in the afternoon. These observations refer principally to the summer, though they affect spring and autumn nearly in the same ratio.

5. The moon's change, first quarter, full and last quarter, happening during six of the afternoon hours, i. e. from 4 to 10, may be allowed by fair weather; but this is mostly dependent on the wind, as noted in the table.

6. Though the weather, from a variety of irregular causes, is more uncertain in the latter part of autumn, the whole winter, and the beginning of spring, yet in the main, the above observations will apply to those periods also.

7. To prognosticate correctly, especially in those cases where the wind is concerned, the observer should be within sight of a good vane, where the four cardinal points of the heavens are correctly placed. With this precaution, he will scarcely ever be deceived in depending on the table.—*Dr. Adam Clarke.*

Preserving Roots.

[*From the Yankee Farmer.*]

Every person that has a family should lay in a good stock of roots for winter, whether he raises them or not; if he raise them, the best should be selected in the fall and properly preserved; and if he has to purchase them, then he should do it while they are in good condition, and save them well, instead of buying them after they have lost much of their good qualities, as is the case when they are saved without proper attention.

Beets, carrots, turnips, parsnips, &c. are often put into the cellar without any protection from the air, and they soon become dry and poor, or they may be put in large piles in a warm cellar and heat, and thus become poor. These roots of the proper shape and quality, should be selected very soon after they are dug, and saved in pure earth or sand. If there be a convenient place to lay them on the ground in a bin, or corner of the cellar, in small quantities, they may be saved well by covering them well with earth; if the quantity of roots be large, there should be alternate layers of roots and earth. If it be convenient, it is as well to put the roots in a close box or cask, first a layer of earth, then one of roots, and a good covering of earth on top. Either of these methods may be followed, as most convenient. The roots are best saved by being embedded closely in earth and having enough to cover them to prevent its drying readily.

When roots are covered with earth, they may be saved in a cooler cellar than when exposed, as they will be much less liable to freeze, and when thus protected they keep better where it is tolerably cool. Any pure earth, having only a common degree of moisture, is good for saving roots, and will answer about as well as sand if it be fine so that it will run down closely and cover them. A person living in a city and having only a garden spot, can generally get good earth for this purpose, by removing the top as far as it has been cultivated and taking up the pure soil below.

Most farmers have good cellars in which they can lay their potatoes on the earth, and by keeping their cellars shut close and free from light, they usually save their potatoes well without covering them, but they must not infer from this that other roots may be kept well in the same manner, for as they are more liable to injury from being dried and exposed to air, they should be protected with more care.

We have known good turnips and beets become very poor in a few months, when with proper care in laying them down in earth they might have been kept perfectly good till warm weather. We had some early garden stone turnips last fall, which kind is of as transient duration as any kind cultivated; we put them in a barrel with layers of earth, and they were excellent the first of May; they continued good till the warm weather caused them to grow.

Most persons that raise parsnips let them remain in the ground till spring, and then they can have only a few messes before they begin to grow; instead of this way, a part should be dug and put in the cellar, packed in earth, that they may be used as wanted through the winter.

The best roots for eating are of a small or middling size; the large ones should be given to stock. Turnips that were sown late and have acquired only one third or one half the usual size, are of a much better quality for present use, and they keep far better than those that have a full growth.

There is generally time enough to raise turnips for winter use after digging early potatoes. Some of sufficient size were raised in that way last year, and we have seen some this season that have already attained a good size for eating, on ground that has produced a crop of potatoes; and they will probably grow a month or more yet.

Receipt for Curing Pork and Hams.

[*From the Farmers' Cabinet.*]

As soon as the pork becomes cool, I cut and sort it, taking great care to have the tubs perfectly sweet and clean. In cutting, I take out all the spare ribs, and make pickled pork of all the side between the ham and the shoulders; cutting it into pieces of suitable size for family use. I trim the hams and shoulders well. I cover the bottom of the tub with rock salt, and then put in a layer of pork, nicely packed; then cover this layer with salt, and so on, until the tub is filled. I use rock salt and very bountifully. In six or eight days, make a pickle of salt, and cold water, as strong as possible, and cover the pork previously salted with it. It will then keep for use for years if you choose.

In preparing the hams and shoulders, I weigh several, to come at the probable weight of the whole. They are packed with great care, in suitable tubs. My process is to sprinkle some coarse salt at the bottom; then pack in the hams and shoulders firmly, side by side, being careful not to put the back of one flat on the top of another. The spaces are filled up with chines, hocks and jowls. To about every 300 weight of meat, I take 20 pounds of rock salt, one pound of salt petre, and fourteen pounds of brown sugar, or half a gallon of good molasses, (generally the latter.) Take as much pure water as will cover the meat, put in a clean vessel, add the above articles, boil it, removing the scum as it rises, and when no more rises set it to cool, after which pour it on the meat until it is covered three or four inches.

If the hams are small, weighing from 12 to 15 pounds, let them remain in the pickle five weeks—if from 15 to 25, six weeks—if from 25 to 45 seven weeks. When you remove them for the purpose of smoking, put them in clean cold water for two or three hours. If there is too much salt or salt petre adhering to the surface of the hams, the water will take it off. The smoke should be made of clean green hickory. A fire should be built only in dry weather. And when the meat has acquired a yellow tinge, not red or black, they are removed and hung up in a dark place where they are not disturbed by flies or vermin.

DAVID COMFORT.

Things a Farmer should not do.

[*From the Common School Assistant.*]

1. A farmer should never undertake to cultivate more land than he can do thoroughly; half-tilled land is growing poorer; well tilled land is constantly improving.

2. A farmer should never keep more cattle, horses, sheep or hogs, than he can keep in good order: an animal in high order the first of December, is already half wintered.

3. A farmer should never depend on his neighbor, for what he can by care and good management produce on his own farm; he should never beg fruit while he can plant trees, or borrow tools when he can make or buy; a high authority has said, the borrower is a servant to the lender.

4. The farmer should never be so immersed in political matters as to forget to sow his wheat, dig his potatoes and bank up his cellar; nor should he be so inattentive to them as to be ignorant of those great questions of national and state policy which will always agitate, more or less, a free people.

5. A farmer should shun the doors of a bank as he would the approach of the plague or cholera; banks are for traders and men of speculation, and theirs is a business with which farmers have little to do.

6. A farmer should never be ashamed of his calling; we know that no man can be entirely independent, yet the farmer should remember, that if any one is said to possess that enviable distinction, he is the man.

7. No farmer should allow the reproach of neglecting education to lie against himself or family: if knowledge is power, the beginning of it should be early and deeply laid in the district school.

8. A farmer should never use ardent spirits as a drink; if, while undergoing severe fatigue and the hard labor of the summer he would enjoy robust health, let him be temperate in all things.

9. A farmer never should refuse a fair price for any thing he wants to sell; we have known a man who had several hundred bushels of wheat to dispose of, refuse 8s. because he wanted 8s. 6d. and after keeping his wheat six months, was glad to get 6s. 6s. for it.

10. A farmer should never allow his wood house to be emptied of wood during the summer season; if he does, when winter comes, in addition to cold fingers, he must expect to encounter the chilling looks of his wife, and perhaps be compelled, in a series of lectures, to learn that the man who burns green wood has not mastered the A B C of domestic economy.

11. A farmer should never allow a window to be filled with red cloaks, tattered coats, and old hats; if he does he will most assuredly acquire the reputation of a man who tarries long at the whiskey, leaving his wife and children to starve at home.

Facts for the Fireside.

[*From the Vermont Phœnix.*]

"Tis thus Benevolence her laws fulfils,
And Justice executes what Nature wills.

All the laws of Nature, but especially those of our own organization, are instituted in infinite benevolence; and every instance of pain, sickness and suffering, is an example of the penalty attached to one or more of these violated laws.

The two most prominent laws of our organization relate to nutriment and exercise.

Our bodies are made up of organs fitted to the performance of certain functions. These organs, thus in a state of constant *action* necessarily occasion a wear and waste; and this waste demands a supply for the usual reparation. Whence then is this supply derived?—Chiefly from solids and fluids received into the stomach. Under the influence of the vital power the necessary selection and appropriation is made.

A diet too poor and unstimulating often begets scrofula and many other constitutional maladies. The poor Irish, and the hungry herds who subsist on the meagre pittance of soup societies, are painful examples of the truth of this remark. Among the opulent, however, the opposite error prevails—as their bloated forms and gouty limbs plainly show.

Gluttony is a breach of the law, the penalty of which is so irretrievable that no violator can escape.

A certain amount of food is necessary for the healthy support of the human body, and every iota taken into the stomach, over and above what the law of nature requires, tends to weaken the constitution and induce disease.

The quantity that some people are able to crowd into their stomachs, by long habits of gluttony, is indeed enormous. A case is recorded of a man who ate 64 pounds of food daily, for six days; and another of a Frenchman who used to eat his own weight of beef every 24 hours. A man, recently, in the state of Maine was at work felling trees, and had his dinner brought him at 12 o'clock. At 2 o'clock he left his work, saying he should work no longer unless he could get something more to eat. On inquiry, it was found that he had eaten for his dinner the following articles, viz:—two quarts of fish and potatoes, two quarts of bread and milk, two quarts of old cider, and a one quart or a three quart dish of baked pudding—the good lady of the house did not recollect which. The gentleman who employed him very wisely remarked, that he did not hire him oftener than he could help, for he thought it must take nearly all his strength to digest his food.

It is a fact that the great mass of the community eat food not only too rich and stimulating in quality, but also use far too much in quantity. And but a glance at the community will show that their penalties are meted out in the form of dyspepsias, liver diseases, dropsy, gout, and premature death.

The tender mother wonders that her sinless offspring should suffer so much pain, and then be snatched from her tender embrace by a "mysterious providence,"

when in fact the child only suffers the penalty of just and immutable laws which her own pampering has broken.

The stomach, like every other organ, requires rest after the performance of its labor. And yet how every mother will tell her dyspeptic son to "eat little and often." Oh, ruinous practice! "eat little and often"—the echo of these words has been the death dirge of thousands. Ah! how does it ring upon the ear of the poor dyspeptic, and how does it hasten his progress to that grave which he so much dreads!

The Wealth of a Country depends upon the Farmers and Mechanics.

[*From the Maine Farmer.*]

What is wealth? Those things which are convenient and necessary to use, and which administer to our wants and our comforts. Money alone, cannot therefore, be considered as wealth, because if the articles or things above mentioned are not to be had, or are not in existence, a man would be poor indeed, though he were loaded with gold and silver. If he were hungry and there was no bread to be bought, if he were shivering with cold and there were no garments made for sale, his gold would be but of little service. It is true, mankind, by a common consent, have agreed that gold and silver should be the sign or evidence of property,—or in other words, the *measure* of property; and he who has a certain amount of it, has evidence of so much wealth.—He can exchange it for the very things or articles which do in fact constitute wealth.

Thus a man who has a hundred dollars in his pocket has the *ticket*, as it were, to entitle him to *enter* into the possession of an hundred bushels of corn, or a hundred yards of cloth, or a hundred acres of wild land,—or a yoke of oxen, or a horse and wagon, as the case may be. But if these things do not exist, and he needs them, his *ticket* is of no more use, than if he had a ticket to go into a theatre, and it should have been burned down before he used it. The elements therefore of wealth consists in natural productions, brought together, changed and modified by the skill and labor of man; of the farmer and mechanic. Commerce, though necessary and honorable, is nothing more than the *moving* or *changing* of these productions from place to place. It has always appeared singular to us, that merchants should consider themselves, as too many, far too many of them do, above the farmers or the mechanics, merely on account of their profession, when they are indeed only the *teamsters*, to the others. They are the agents to transport their productions hither and thither, as calls may exist for them. But to return to the subject. If we are right in the position which we have taken, that wealth consists in natural productions changed and wrought upon by the labor of man, it follows that the country which possesses the most of the elements or materials to work upon, such as good soil—abundance of water power—forest of timber—quarries of different kinds of stones, mines, and beds of different kinds of minerals, &c. &c., must have the most natural wealth. It then only requires the hand of industry and skill to put these materials into shape, and to put them together to form real substantial wealth. This is the duty of the farmer and mechanic. They are the second creators of wealth.—They take the raw materials as it came from the hands of the Almighty, and change it by their labor into the thousands and tens of thousands of different forms which render it useful to man, which make it subservient to the wants and comforts of human life. The more industrious and skilful this class is, the more wealth will be accumulated in the country. Do farmers and mechanics consider these things rightly? Are they not too apt to think themselves as mere plodders and servants, rather than as second to the great first cause in the production and increase of wealth? And indeed is there not a false standard of respectability too much in use in society, and are not the productive classes apt to measure themselves by it? This standard appears to be *idleness and a fine coat;* and consequently, the more idle a man can be, and the finer the dress, the more of a gentleman. Not so. Respectability should consist in an improved mind, and skilful and industrious hands.—Moral qualifications being equal, he should have the most honor, who, by the combination of the efforts of his mind and physical powers, has contributed most largely to the increase of those things which constitute wealth.

Such an one has done more for the amelioration of society, than a thousand unproductive *dandies*, who loll in the shade and wash in Cologne. And society should bestow upon such a corresponding meed of honor.

New Mode of Stacking Grain.

[*From the Farmers' Magazine.*]

Sir,—The long continuance of rain in this part of the country has occasioned many very serious losses in our hay crops, and as the weather continues here in a very unsettled state, I am apprehensive hill farmers may probably suffer considerably in the ensuing corn harvest, unless every precaution is taken which prudence may dictate. I am therfore induced to intrude on you for a small space in your valuable publication, to state a practice which farmers in the upper part of the county of Cardigan are in the habit of, and without which I am convinced they would in the generality ot seasons lose a very large portion of their corn. Our hills are much more subject to rain than the land in England, I therefore do not presume to offer advice to any but those who are situate as we are. Our practice in the upper part of Cardiganshire is to bind *all* our corn, spring as well as winter crops, and to put them into small mows in the field in the shape of a sugar-loaf. We begin each mow by placing three sheaves on the stubble, the head of each sheaf inclining to the centre of the intended mow, and resting on the binding of the sheaf next to it. We then build our mow by adding other sheaves, the heads of which resting on the three laid as a foundation, gives a position to the but of each succeeding sheaf, inclining downward so as to throw off the rain. In this manner we proceed until we have added as many sheaves as will nearly make a load for the vehicle we have (whether cart or wagon) to carry with. We then contract the top of the mow to as sharp a point as possible, over which we place a reversed sheaf banded close to the but, and with a long rod running down through it into the top of the mow, spreading the ears of the upper sheaf or cap as equally round the mow as we can. By this method I have had corn which has stood in the field three weeks during continued rain brough home without the loss of a single sheaf. I am not sure but the above practice may be generally *known* to hill farmers in different parts of the kingdom, but I am quite sure it is not generally practised by them, as I have very frequently seen beautiful crops of corn within a few miles of me, spoiled by farmers attempting to harvest them in the manner of the English farmers. I am, sir, your very humble servant. A. C. F.

18*th July*, 1838

There is one material advantage in the above practice which should be noticed. We can get up our crop into mow between showers, and carry home in similar opportunities, without exposing more than one load at a time to the weather.

What has become of Mr. Kimberley's plan, noticed in your magazine for February last, page 89? I am fully persuaded it is practicable, and am anxiously looking for the development.

Horticultural Exhibition.

The large room in the Stuyvesant Institute, has been graced the last three days with very a choice variety of fruits and vegetables, sent by contributors to the exhibition of the Horticultural Society of the country on the Hudson. This association has only been formed the present season, and this is the first attempt to array the products of the society before the public. The society being yet in its infancy, the exhibition does not, of course, embrace the extent and variety of articles that might be expected of older and more mature associations, but what has been gathered is of rare quality and fine appearance.

The garden and nurseries of the Downings, at Newburg, have contributed fruits of the finest flavor and size. The grapes and plumbs, gages, pears, apples and peaches from that place are a beautiful sight, and display a taste and culture highly creditable to the cultivators. Not less praiseworthy are those of Roe, of Newburgh. The black Hamburgh grapes of both these gardens, as well as those of J. P. Cushing, at Watertown, near Boston, appear to be fine beyond example. The other varieties of this fruit are numerous. A kind of pear called Dutchess D'Angouleime, produced by E. Vose, of Dorchester, Mass. is very fine in appearance, as well as some fruit* from the farm of Judge Buel, of Albany. The sickel pears of Mr. Arden, of West Point, are a superior fruit, excelling, undoubtedly, the vergalu, which is falling into neglect. The black Hamburgh grapes of Miss Verplanck, Fishkill Landing, raised in the open air, are, we think, equal to those of Cushing, under glass. The Muscat of Lunel, however, of the last mentioned person, presents tempting clusters

In the vegetable line, there are numerous parcels, consisting of celery, carrots, parsnips, beets, pumpkins, corn, &c. &c. all of course, mammoth productions, and raised by the best gardeners in our vicinity.

Thorburn seems to have monopolized most of the Dahlias, of which there are hundreds of every hue, and some very rare.

On the whole, the society has made a good beginning, and we hope will thrive in its efforts to increase the taste for horticultural pursuits. The valley of the Hudson is a field which may be yet cultivated with a certainty of its producing fruits which will rival those of the most favored climates.—*Evening Post.*

Rohan Potatoes.—In our last number, we recorded the fact, that friend Orsment, of the United Society, had raised one bushel of potatoes from a single tuber. We have now to notice, that the Hon. William Clark, Jr. of Northampton, raised *two bushels and one peck*, from one Rohan potato.—*Yankee Farmer.*

Durham Cattle.—The Lexington Intelligencer of the 14th September says, there have been two sales of short horn Durham cattle in that neighborhood, being the stock of Maslin and Samuel Smith, Esqrs. At the sale of the latter, a cow and sucking calf sold for $2,100.—Another at $1,350—others at $1,100, $1,000, &c. The whole stock of Samuel Smith sold for between $20,000 and $30,000.

A bold child, who looks you in the face, speaks the truth, and shames the devil—that is the stuff of which to make men good and brave—aye, and wise men.—*Bulwer.*

* This "*some fruit*" comprised samples of 86 varieties of autumn and winter apples, of known celebrity, and about 20 varieties of pears.—*Cond.*

Expenditures of the Government.

In the House of Representatives, on Thursday last, the Speaker laid before the House a letter from the Secretary of the Treasury, in answer to a resolution of the 25th June, showing the amounts of expenditure, exclusive of the public debt, for each year, from 1824 to 1838. They are as follows, viz:

For the year	1824,.....	$15,330,444 71
Do	1825,.....	11,490,459 94
Do	1826,.....	13,062,316 27
Do	1827,.....	12,653,095 65
Do	1828,.....	13,296,041 45
Do	1829,.....	12,660,460 62
Do	1830,.....	13,229,553 33
Do	1831,.....	13,864,067 90
Do	1832,.....	16,516,388 77
Do	1833,.....	22,713,755 11
Do	1834,.....	18,425,417 25
Do	1835,.....	17,514,950 28
Do	1836,.....	30,868,164 04
Do	1837,.....	39,164,745 37*

* This sum is subject to small variation on the settlement of the accounts of the Treasurer.

Note—The above sums include payments for Trust Funds and Indemnities, which, in 1837, were $5,610,404. 36.—*National Intelligencer of July.*

Sickness in the West.—The Land Sales.—The citizens of Northern Indiana have addressed a petition to the President of the United States, asking a postponement of the sales of the public lands in that section. They give as their reasons for making this request, that "there is now prevailing throughout all that section an unparalleled epidemic, that is carrying hundreds to their graves, and thousands to their sick beds, while their crops are rotting in the fields unharvested; amid such universal distress that it renders it impossible for the settlers to make the necessary exertions to obtain the means of purchasing their humble homes."

Young Men's Department.

Poor Richard's Almanac.

*The Way to Wealth, as clearly shown in the Preface of an old Pennsylvania Almanac, entitled, Poor Richard Improved.**

Courteous Reader,—I have heard, that nothing gives an author so great pleasure, as to find his works respectfully quoted by others. Judge, then, how much I must have been gratified by an incident I am going to relate to you. I stopped my horse lately, where a great number of people were collected, at an auction of merchants goods. The hour of the sale not being come, they were conversing on the badness of the times; and one of the company called to a plain clean old man, with white locks, 'Pray, Father Abraham, what think you of the times? Will not these heavy taxes quite ruin the country? How shall we ever be able to pay them? What would you advise us to?'—Father Abraham stood up, and replied, 'If you would have my advice, I will give it to you in short, "for a word to the wise is enough," as Poor Richard says.' They joined in desiring him to speak his mind, and gathering round him, he proceeded as follows:

'Friends,' says he, 'the taxes are, indeed, very heavy and, if those laid on by the government were the only ones we had to pay, we might more easily discharge them; but we have many others, and much more grievous to some of us. We are taxed twice as much by our idleness, three times as much by our pride, and four times as much by our folly; and from these taxes the commissioners cannot ease or deliver us, by allowing an abatement. However, let us hearken to good advice, and something may be done for us; "God helps them that help themselves," as poor Richard says.

'I. It would be thought a hard government that should tax its people one tenth part of their time, to be employed in its service: but idleness taxes many of us much more; sloth, by bringing on diseases, absolutely shortens life. "Sloth, like rust, consumes faster than labor wears, while the used key is always bright," as poor Richard says. "But dost thou love life, then do not squander time, for that is the stuff life is made of," as poor Richard says. How much more than is necessary do we spend in sleep! forgetting, that "the sleeping fox catches no poultry, and that there will be sleeping enough in the grave," as poor Richard says.

'"If time be of all things the most precious, wasting time must be," as poor Richard says, "the greatest prodigality;" since, as he elsewhere tells us, "lost time is never found again; and what we call time enough always proves little enough;" let us then up and be doing, and doing to the purpose; so by diligence shall we do more with less perplexity. "Sloth makes all things difficult, but industry all easy; and he that riseth late, must trot all day, and shall scarce overtake his business at night; while laziness travels so slowly, that poverty soon overtakes him. Drive thy business, let not that drive thee; and early to bed, early to rise, makes a man healthy, wealthy, and wise," as poor Richard says.

* Dr. Franklin for many years published the Pennsylvania Almanac, called *Poor Richard* [*Saunders,*] and furnished it with various sentences and proverbs, which had principal relation to the topics of "industry, attention to one's own business, and frugality." The whole or chief of these sentences and proverbs he at last collected and digested in the above general preface, which were read with much avidity and profit; and perhaps tended more to the formation of a national character in America, than any other cause.

'So what signifies wishing and hoping for better times? We may make these times better, if we bestir ourselves. "Industry need not wish, and he that lives upon hope will die fasting. There are no gains without pains; then help hands, for I have no lands," or, if I have, they are smartly taxed. "He, that hath a trade, hath an estate; and, he that hath a calling, hath an office of profit and honor," as poor Richard says; but then the trade must be worked at, and the calling well followed, or neither the estate nor the office will enable to us pay our taxes. If we are industrious, we shall never starve; for, "at the working man's house, hunger looks in, but dares not enter." Nor will the bailiff or the constable enter, for "industry pays debts, while despair increaseth them." What though you have found no treasure, nor has any rich relation left you a legacy, "diligence is the mother of good luck, and God gives all things to industry. Then plough deep, while sluggards sleep, and you shall have corn to sell and to keep."—Work while it is called to-day, for you know not how much you may be hindered to-morrow. "One to-day is worth two to-morrows," as poor Richard says; and farther, "never leave that till to-morrow, which you can do to-day." If you were a servant, would you not be ashamed that a good master should catch you idle? Are you then your own master? Be ashamed to catch yourself idle, when there is so much to be done for yourself, your family, your country, and your king. Handle your tools without mittens; remember, that "the cat in gloves catches no mice," as poor Richard says. It is true, there is much to be done, and perhaps you are weak-handed; but stick to it steadily, and you will see great effects, for "constant dropping wears away stones; and by diligence and patience the mouse ate in two the cable; and little strokes fell great oaks."

'Methinks I hear some of you say, "must a man afford himself no leisure?" I will tell thee, my friend, what poor Richard says; "employ thy time well, if thou meanest to gain leisure; and since thou are not sure of a minute, throw not away an hour." Leisure is time for doing some thing useful; this leisure the diligent man will obtain, but the lazy man never; for "a life of leisure and a life of laziness are two things.—Many, without labor, would live by their wits only, but they break for want of stock;" whereas industry gives comfort, and plenty, and respect. "Fly pleasures, and they will follow you. The diligent spinner has a large shift; and now I have a sheep and a cow, every one bids me good-morrow."

'II. But with our industry we must likewise be steady, settled, and careful, and oversee our own affairs with our own eyes, and not trust too much to others; for, as poor Richard says,

"I never saw an oft-removed tree,
Nor yet an oft-removed family,
That throve so well as those that settled be."

And again, "three removes is as bad as a fire;" and again, "keep thy shop, and thy shop will keep thee;" and again, "if you would have your business done, go, if not, send." And again,

"He that by the plough would thrive,
Himself must either hold or drive."

And again, "the eye of a master will do more work than both his hands;" and again, "want of care does us more damage than want of knowledge and;" again, "not to oversee workmen, is to leave them your purse open." Trusting too much to other's care is the ruin of many; for, "in the affairs of this world, men are saved, not by faith, but by the want of it;" but a man's own care is profitable; for, "if you would have a faithful servant, and one that you like, serve yourself. A little neglect may breed great mischief; for want of a nail the shoe was lost, and for want of a shoe the horse was lost, and for want of a horse the rider was lost," being overtaken and slain by the enemy; all for want of a little care about a horse-shoe nail.

'III. So much for industry, my friends, and attention to one's own business; but to these we must add frugality, if we would make our industry more certainly successful. A man may, if he knows not how to save as he gets, "keep his nose all his life to the grindstone, and die not worth a groat at last. A fat kitchen makes a lean will;" and

"Many estates are spent in the getting,
Since women for tea forsook spinning and knitting,
And men for punch forsook hewing and splitting."

"If you would be wealthy, think of saving, as well as of getting. The Indies have not made Spain rich, because her outgoes are greater than her incomes."

'Away then, with your expensive follies, and you will not then have so much cause to complain of hard times, heavy taxes, and chargable families; for,

"Women and wine, game and deceit,
Make the wealth small, and the want great."

And farther, "what maintains one vice, would bring up two children." You may think, perhaps, that a little tea, or a little punch now and then, diet a little more costly, clothes a little finer, and a little entertainment now and then, can be no great matter; but remember, "many a little makes a mickle." Beware of little expenses; "a small leak will sink a great ship," as poor Richard says; and again, "who dainties love, shall beggars prove;" and moreover, "fools make feasts, and wise men eat them."

'Here you are all got together to this sale of fineries and nick-nacks. You call them *goods*, but if you do not take care, they will prove *evils* to some of you. You expect they will be sold cheap, and perhaps they may, for less than they cost; but, if you have no occasion for them, they must be dear to you. Remember what poor Richard says, "buy what thou hast no need of, and ere long thou shalt sell thy necessaries." And again, "at a great penny-worth pause a while." He means, that perhaps the cheapness is apparent only, and not real; or the bargain, by straitening thee in thy business, may do thee more harm than good. For in another place he says, "many have been ruined by buying good penny-worths." Again, "it is foolish to lay out money in a purchase of repentance;" and yet this folly is practised every day at auctions, for want of minding the almanac. Many a one, for the sake of finery on the back, have gone with a hungry belly, and half starved their families; "silks and satins, scarlet and velvets, put out the kitchen fire," as poor Richard says. These are not the necessaries of life, they can scarcely be called the conveniencies; and yet, only because they look pretty, how many want to have them? By these and other extravagancies, the genteel are reduced to poverty, and forced to borrow of those whom they formerly despised, but who, through industry and frugality, have maintained their standing; in which case it appears plainly, that "a ploughman on his legs is higher than a gentleman on his knees," as poor Richard says. Perhaps they have had a small estate left them, which they knew not the getting of; they think "it is day, and it will never be night; that a little to be spent out of so much is not worth minding; but always taking out of the meal-tub, and never putting in soon comes to the bottom," as poor Richard says; and then, "when the well is dry, they know the worth of water." But this they might have known before, if they had taken his advice; "if you would know the value of money go and try to borrow some; for he that goes a borrowing goes a sorrowing," as poor Richard says; and indeed so does he that lends to such people, when he goes to get it again. Poor Dick farther advises, and says,

"Fond pride of dress, is sure a curse,
Ere fancy you consult, consult your purse."

And again, "pride is as loud a beggar as want, and a great deal more saucy." When you have bought one fine thing, you must buy ten more, that your appearance may be all of a piece; but poor Dick says, "it is easier to suppress the first desire than to satisfy all that follow it;" and it is as truly folly for the poor to ape the rich, as for the frog to swell in order to equal the ox.

"Vessels large may venture more,
But little boats should keep near shore."

It is, however, a folly soon punished; for, as poor Richard says, "pride that dines on vanity, sups on contempt; pride breakfasted with plenty, dined with poverty, and supped with infamy." And, after all, of what use is this pride of appearance, for which so much is risked, so much is suffered? It cannot promote health, nor ease pain; it makes no increase of merit in the person; it creates envy, it hastens misfortune.

'But what madness must it be to *run in debt* for these superfluities! We are offered by the terms of this sale six months credit; and that perhaps has induced some of us to attend it, because we cannot spare the ready money, and hope now to be fine without it. But ah! think what you do when you run in debt; you give to another power over your liberty. If you cannot pay at the time, you will be ashamed to see your creditor, you will be in fear when you speak to him, when you will make poor pitiful sneaking excuses, and by degrees come to lose your veracity, and sink into base, downright lying; for, "the second vice is lying; the *first* is running in debt," as poor Richard says; and again to the same purpose, "lying rides upon debt's back;" whereas a free-born Englishman ought not to be ashamed nor afraid to see or speak to any man living. But poverty often deprives a man of all spirit and virtue. "It is hard for an empty bag to stand upright." What would you think of that prince, or of that government, who should issue an edict forbidding you to dress like a gentleman or gentlewoman, on pain of imprisonment or servitude? Would you not say, that you were free, have a right to dress as you please, and that such an edict would be a breach of your privileges, and such a government tyrannical? And yet you are about to put yourself under that tyranny, when you run in debt for such dress! your creditor has authority, at his pleasure, to deprive you of your liberty, by confining you in a gaol for life, or by selling you for a servant, if you should not be able to pay him. When you have got your bargain, you may, perhaps, think little of payment; but, as poor Richard says, "creditors have better memories than debtors; creditors are a superstitious sect, great observers of set-days and times." The day comes round before you are aware, and the demand is made before you are prepared to satisfy it; or, if you bear your debt in mind, the term, which at first seemed so long, will as it lessens, appear extremely short; time will seem to have added wings to his heels as well as his shoulders.—"Those have a short lent, who owe money to be paid at Easter." At present, perhaps, you may think yourselves in thriving circumstances, and that you can bear a little extravagance without injury; but

"For age and want save while you may,
No morning sun lasts a whole day."

Gain may be temporary and uncertain, but ever, while you live, expense is constant and certain; and, "it is easier to build two chimneys than to keep one in fuel," as poor Richard says; so, "rather go to bed supperless than rise in debt."

"Get what you can, and what you get hold,
'Tis the stone that will turn all your lead into gold."

And when you have got the philosopher's stone, sure you will no longer complain of bad times, or the difficulty of paying taxes.

'IV. This doctrine, my friends, is reason and wisdom; but, after all, do not depend too much upon your own industry, and frugality, and prudence, though excellent things; for they may all be blasted, without the blessing of heaven; and thereforeask that blessing humbly, and be not uncharitable to those that at present seem to want it, but comfort and help them. Remember Job suffered, and was afterwards prosperous.

'And now, to conclude, "experience keeps a dear school, but fools will learn in no other," as poor Richard says, and scarce in that; for, it is true, "we may give advice, but we cannot give conduct:" however, remember this, "they that will not be counselled cannot be helped;" and father, that "if you will not hear reason she will surely rap your knuckles," as poor Richard says.'

Thus the old gentleman ended his harangue. The people heard it, and approved the doctrine; and immediately practised the contrary, just as if it had been a common sermon, for the auction opened and they began to buy extravagantly.—I found the good man had thoroughly studied my almanacs, and digested all I had dropt on those topics during the course of twenty-five years. The frequent mention he made of me must have tired any one else: but my vanity was wonderfully delighted with it, though I was conscious, that not a tenth part of the wisdom was my own, which he ascribed to me, but rather the gleanings that I had made of the sense of all ages and nations. However, I resolved to be the better for the echo of it; and, though I had at first determined to buy stuff for a new coat, I went away, resolved to wear my old one a little longer. Reader, if thou will do the same, thy profit will be as great as mine.

I am as ever, thine to serve thee,
RICHARD SAUNDERS.

Chemical Catechism—Chapter VI.

[*From Parkes's Chemical Catechism.*]

OF LIME.

How is lime to be distinguished from the other earths?

Lime is of a white colour, and of a hot caustic taste; it forms peculiar salts with acids, which is perhaps the most decisive proof that can ever be obtained to identify this or any other earth: it changes vegetable blues to a green; it is incapable of fusion; it solidifies water,* when sprinkled with that fluid, occasioning it to give out a greater quantity of caloric; it absorbs moisture and carbonic acid,† when exposed to atmospheric air; but is itself very sparingly soluble in water, and possesses the peculiar property of dissolving more copiously in cold than in hot water.

In what state is lime found in nature?

Lime is never found pure; it is always in a state of combination, generally with an acid, and more frequently with the carbonic acid, as in chalk, marble, limestone, &c.‡ It is found also in vegetables, and is the basis of animal bones. It occurs likewise in the waters of all springs and rivers.

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* Quick-lime has such an affinity for water that it will absorb one-fourth of its weight of that fluid, and yet remain perfectly dry. The water becomes solidified and identified with the earth. The heat, therefore, that is evolved in the process of slaking lime, proceeds from the water as it passes to the solid state, and not from the earth as is sometimes supposed.

† The effect of carbonic acid upon lime may be shown by the following experiment:—Add gradually a very small quantity of water impregnated with carbonic acid to a jar about one-fourth filled with lime-water. A milkiness will ensue, because the carbonic acid forms with the lime an insoluble compound. On adding more of the carbonated water, and shaking the jar as these additions are made, the milkiness at last disappears, and the whole precipitates becomes re-dissolved. Hence, it appears that lime with a *small* quantity of carbonic acid is insoluble, and soluble with a *larger* quantity.

‡ The vast mountains of calcareous earth which occur in different parts of the world, owe their origin, in general, it is supposed, to the destruction of marine testacious animals, which in long process of time, formed these extensive and accumulated heaps.

"For in vast shoals beneath the brineless tide,
On earth's firm crust, testaceous tribes reside:
Age after age expands the peopled plain,
The tenants perish, but their cells remain:
Whence coral walls and sparry hills ascend
From pole to pole, and round the line extend."—*Darwin.*

Fourcroy, in his *Chemical Elements*, has given a beautiful account of this process of nature, to which I refer; as I am persuaded every reader of taste must be charmed with its perusal. See *Dr. John Thompson's Edition, part iii. chap.* 7, *sect.* 1.

According to Capt. Cook, there are in the Southern Ocean, perpendicular coralline rocks, formed entirely of sea-shells, which are of such magnitude as to render the navigation of those seas extremely dangerous.

The shells of some testaceous animals in the South Sea are of a vast size. The *lemo* shell on the coast of Sumatra is frequently found three or four feet in diameter, and as white as ivory. See *Marsden's History of the Island of Sumatra, page* 10.

It may be remarked, that while *testaceous* shells are formed with carbonate of lime, the shells of *crustaceous* animals, and the shells of birds' eggs contain also a portion of phosphate of lime. Its use in the former is not known; but the design of nature in furnishing the shells of eggs with phosphoric acid is very apparent. The body of the egg contains neither phosphoric acid or lime: it was necessary, therefore, that nature should provide means of furnishing both these substances, which it does at the expense of the shell; which becomes thinner and thinner during the whole time of incubation, till the living embryo hath appropriated a sufficient quantity for

How is lime procured from these minerals?

Carbonate of lime, by whatever name it is called, whether chalk, marble, limestone, oyster shell, &c. is broken into convenient pieces, and piled in alternate layers, with coal, furze or other fuel, in proper kilns, where it is kept for a considerable time in a *white* heat. By this means, the carbonic acid and water are driven off, and tolerably pure lime is the product.*

What are the chief uses of lime?

Lime united with the acids is applied to various useful purposes, and next to silica, forms a material portion of the solid fabric of the terrestrial globe. In its pure state, it is used in many of the arts,† particularly in making mortar for buildings. It is employed by the farmers as a manure; also by bleachers, tanners, sugar bakers, soap-boilers, iron masters,‡ and others, in their several manufactories, and in medicine.

How do you explain the operation of lime in forming mortar?

Pure lime has, when united to a certain portion of water, a very strong affinity for silica, another most essential ingredient in all mortar and cements; for without this it never hardens—but when mixed in proper proportions, the gradual absorption of carbonic acid from the atmosphere occasions it in a series of years to become as hard as unburnt limestone.§

How does lime act so as to be of use as a manure for land?

The use of lime in agriculture may be attributed to the property which it possesses of hastening the dissolution and putrefaction of all animal and vegetable matter,‖ and of imparting to the soil a power of retaining a quantity of moisture necessary for the nourishment and vigorous growth of the plants, corn, &c.¶ for there is no good soil that does not contain a certain portion of lime, though always, without exception, combined with carbonic acid.

What is the use of lime in the operation of tanning leather?

Lime is used by the tanner in a state of solution; in this the hides are immersed in order to dissolve the gelatinous part of the skin, and to facilitate the removal of the hair.**

How is lime used in refining sugar?

By boiling the sugar in lime-water the manufacturer deprives it of a certain uncombined acid,* which prevents its crystallization.

What is the use of lime in the manufacture of soap?

Lime is mixed with the alkali in order to deprive it of carbonic acid. The alkali is thus rendered what is called *caustic*, and by this means is fitted to combine with the oil or tallow which is thereby converted into soap.

We have hitherto spoken only of lime and of carbonate of lime:—Is lime found in any other state of combination?

Yes: lime occurs in combination with sulphuric acid forming gypsum;† with the fluoric acid constituting fluor spar;‡ with the phosphoric acid in a mineral called *apatite*,§ and in some precious stones.

What is magnesia?

Magnesia is a very soft, white light earth, with little taste or smell; unalterable in the fire, and almost insoluble in water. Nevertheless it absorbs a considerable portion of water when that fluid is poured upon it, and heat is evolved. It dissolves in alkaline carbonates, but is not soluble in the caustic alkalies.

How is magnesia procured?

Magnesia is never found in a state of purity, but always in combination with some acid. It is generally procured from sulphate of magnesia,‖ which exists with the muriate of this earth in sea-water, and in many springs. Magnesia is also a component part of several minerals.

What are the uses of magnesia?

Pure magnesia, as well as the sulphate and carbonate, has important uses in medicine.¶ It is also required in some chemical processes, and is employed by the manufacturers of enamels and procelain. Calcined magnesia is also the most effectual antidote in case of poison by the mineral acids.

We have spoken of each of the earths separately, but are there not instances in nature of the earths entering into combination with each other?

Yes: minerals are found in every part of the world, in which the earths are combined in different proportions by processes unknown to us, which nature employs to produce that endless variety of what, in common language, we call rocks, stones, gems,** &c.

Is the design of Nature in forming so many distinct earths very apparent?

The earths have several properties in common; yet as every earth possesses different and specific properties, it is evident that Nature designed them for different and distinct purposes of utility.

You have enumerated the separate uses of most of the earths:—Can you recollect the collective advantages which arise from this class of bodies?

The uses of some of these earths are not yet discovered; but the benefits which we derive from lime, clay, silica, and magnesia, are very various and important.

In order to impress your memory, and to finish the consideration of this class of bodies, endeavour to recollect some of the more important uses of those earths with which you are best acquainted.

Lime, then, has an extensive and important use in agriculture;†† it is employed in building, &c. and adds much both to the neatness and durability of our dwellings. Silica is the basis of all mortar and cements, and is a necessary ingredient in earthen-ware, porcelain, and glass. Barytes is employed in chemical laboratories as a re-agent. Magnesia, besides being the basis of several salts, is of great use in medicine; and Alumina, by a due mixture with silica, is capable of forming vessels for chemists that will resist the action of the most concentrated acids; it is the material of which the bricks are formed which construct the walls of our habitations, and it is also spread out by the great Author of nature in strata within our hills and mountains, to arrest the progress of subterraneous waters, and to produce those springs that fertilize the valleys, and which take such diversified courses upon the surface of the globe.

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the formation of its bones. Part of the albumen combines with the shell for this purpose, and another portion forms feathers. One thousand parts of egg shells are composed of

Carbonate of lime,	896
Phosphate of lime,	57
Gluten and moisture,	47
	1000

If fowls are kept in a state of confinement, where they cannot get at any calcareous earth, they lay their eggs without shells.

* Bishop Watson found by experiment, that upon an average, every ton of limestone produced 11 cwt. 1 qr. 4 lbs. of quick-lime, weighed before it was cold; and that when exposed to the air it increased in weight daily, at the rate of a hundred weight per ton for the first five or six days after it was drawn from the kiln. This fact is worth the notice of those farmers who fetch their lime from great distances.

† Lime is used in the manufacture of glue. The design of it is to prevent its becoming flexible by the absorption of moisture, and to add to its strength. Some persons use alum for the same purposes.

‡ The iron ores that are wrought in this country, contain a large portion of alumina, and silica: in order, therefore, to flux these earths, and more effectually separate the iron, a quantity of lime is usually mixed with the ore in the furnace; lime having the property of rendering the other earths more fusible.

§ When lime is made into mortar, it takes a long time in acquiring the portion of carbonic acid which it possessed in the quarry; but the mortar hardens as this absorption takes place. This accounts for the great strength of some ancient buildings, in which the mortar is found to have a greater degree of firmness than even limestone itself.

The nature of the sand which is mixed with lime to form mortar or cement, is of the utmost consequence; the harder and sharper the sand, the better, for if this matter be of a friable nature like chalk, the mortar must be weak.

‖ When quick-lime is spread upon arable land, it destroys by its causticity the organization of all animal and vegetable matters remaining in the soil, and thus renders them a fit pabulum for the future crop. In like manner the lime would also burn up the tender shoots of the fresh plants, and sterilize instead of fructifying the ground; but Nature has so ordered it, that, as the lime falls to powder upon the land it should gradually absorb carbonic acid from the atmosphere, which deprives it of its causticity and converts it into chalk.

¶ Hence lime and chalk are found to be particularly useful on sandy soils. Marl is a mixture of carbonate of lime and clay. See additional notes, No. 20. Marls are useful in agriculture only in proportion to the calcareous earth they contain. Unless they contain more than 30 per cent of lime, they are of no value to the farmer. Of all the modes of trial, the one best suited to the unlearned farmer, is, to observe how much *fixed air* the marl gives out; and this he will learn by dissolving a little of it in diluted muriatic acid, and observing what portion of its weight it loses by the escape of this air. Thus, if an ounce loses only from 40 to 44 grains, he may conclude that the ounce of marl contained only 100 grains of calcareous earth, and that it would be his interest to pay seven times as much for a load of lime as he must pay for a load of marl at the same distance.

Every farmer should ascertain the *nature* of his lime before he uses it in agriculture, as there are many extensive districts in England where the lime contains magnesia, which renders it injurious to the growth of vegetables.

**The theory of tanning is shortly this: After the impurities of the skins are removed, they are steeped in an infusion of oak-bark, which consists of two distinct substances, viz. the gallic acid, and the tanning principle; the latter of these combines chemically with the gelatine and albumen of the skins, and forms leather.

* Lime is frequently used by chemists in processes where there is a superabundant and injurious quantity of acid. The lime seizes the acid, and frees the solution from it, by forming with it a neutral salt.

† Gypsum, or, as it is also called, selenite or sulphate of lime when crystallized, is composed of about 33 lime, 46 parts of sulphuric acid, and 21 water.

‡ Lime combined with the fluoric acid forms those beautiful fluor spars which are brought from the mines of Derbyshire. The most usual colour of this mineral is that of a deep purple; but by exposing it to the rays of a hot sun, or to different degrees of artificial temperature, the artist has found the means of forming a suit of colours of great variety and beauty.

§ The bones of all kinds of animals are formed of lime and phosphoric acid in the proportion of 48.5 parts of that earth and 51.5 of phosphoric acid.

‖ Sulphate of magnesia (the Epsom salt of commerce) is found in several mineral waters. The *bitter* saline waters generally owe their taste to this salt. That which is found in the shops is generally procured from the mothers which remain after the separation of common salts from sea-water, by subsequent evaporation and crystallization. All the salts formed with this earth are bitter, and generally very soluble.

¶ When magnesia is taken as an aperient, it ought to be in the state of carbonate of magnesia, or what is called mild magnesia. When as an absorbent to correct acidities, calcined or caustic magnesia is most proper. On several accounts it is of consequence to attend to this distinction.

**Potter's clay is a mixture chiefly of silica and alumina; the colouring earths used as pigments are mixtures either of clay and the oxides of iron, or clay and charcoal; garden mould is a mixture extremely various, sometimes containing silica, alumina, magnesia, iron, lime, and carbon; the common mill-stone is generally composed of alumina and silica; and the crumbling sandstone is a mixture of iron and silica: it is, however impossible to enumerate the endless diversity of substances which Nature offers ready formed for the use of man; for the mixtures of the earths which are found *naturally* combined comprehend most of the varieties of clay, slates, stones, gems, rocks, crystals, zeolites, quartz, flints, &c.

"†† The goodness of a soil depends upon its being able to retain the quantity of moisture which is proper for the nourishment of vegetables, and no more. Now the retentive power of a soil increases with the proportion of its alumina, lime, or magnesia; and diminishes as the proportion of its silica increases."

☞ Farmers' Directory. ☜

☞ We receive almost daily inquiries for seeds, implements, farm stock, &c. many of which it is difficult, and some of them out of our power, to answer satisfactorily. The expense of making and answering these inquiries amounts to no little in the aggregate. To remedy this inconvenience, and to render a service to the seller and buyer, we propose to insert in the extra which will accompany our February number, a Farmers' Directory, that is, to give the names, residence and business, so far as they shall be notified to us by the 10th January, free of charge, of gentlemen engaged in vending agricultural seeds, implements, and choice breeds of farm stock, in whatever state they may reside. As for example,

W. Thorburn, Albany, vends seeds and implements.

H. D. Grove, Buskirk's Bridge, Washington co. N. Y. will sell 100 Saxony sheep.

G. B. Smith, Baltimore, Md. sells Rohan Potatoes and Dutton seed corn.

To the patrons of the Cultivator, no charge will be made for this notice—to others, it will be one dollar. Advertisements, more in detail, will be inserted in a separate portion of the same sheet, on our usual terms. The advantages that are likely to result to advertisers, may be judged from the fact, that our edition is twenty thousand copies, and that our paper circulates in every state and territory in the Union, and in the Canadas.

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*Moneys received during the last month, in sums of five dollars and over. The total receipts are included from post-offices marked with an asterisk.**

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Macon,	Geo. 4		

PRICE CURRENT.

ARTICLES.		New-York. Oct. 22.	Boston. Oct. 24.	Philadelphia Oct. 22.	Baltimore Sept. 18.
Beans, white,	per bush.	1 25 .. 1 30	1 35 .. 1 75	1 50 .. 1 75	1 00 .. 1 25
Beef,	cwt.	7 00 .. 7 50	6 25 .. 7 00	6 00 .. 8 00	7 00 .. 8 50
Bacon, western,	lb.	11 .. 12	13 .. 14	12 00 .. 13 00	15 .. 16
Butter, fresh,	lb.	25 .. 33	18 .. 27	17 .. 19	31 .. 33
Cheese,	lb.	9 .. 12	6 .. 10	8 .. 09	9 .. 10
Cotton, best,	lb.	16 .. 19	9 .. 13	9 .. 14	9 .. 10
Flour, best,	bbl.	8 25 .. 8 75	8 37 .. 9 00	8 00 .. 8 37	7 25 .. 7 50
GRAIN—Wheat,	bush.	1 85 .. 1 87	1 90	1 75 .. 1 80	1 65 .. 2 00
Rye,	bush.	88 .. 90	90	95 .. 1 00	65 .. 66
Oats,	bush.	38 .. 50	53 .. 54	41 .. 46	25 .. 26
Corn,	bush.	91 .. 93	99 .. 1 02	92 .. 94	.. 1 00
Hams, pork,	lb.	12 .. 14	16 .. 17	13 .. 15	14 .. 15
Pork, in bbl.	cwt.	....	10 00 .. 11 50	....	7 25
SEEDS—Red Clover,	bush.	12 00 .. 13 00	12 50 .. 13 00	14 .. 15	11 00 .. ..
Timothy,	bush.	2 35 .. 2 87	2 63 .. 2 75	2 75 .. 3 25	2 25 .. 2 50
Wool—Saxony, fleece,	lb.	45 .. 50	50 .. 55	50 .. 58	50 .. 55
Merino,	lb.	37 .. 38	50 .. 52	48 .. 50	45 .. 50
1-4 and com.	lb.	32 .. 37	35 .. 40	35 .. 37	35 .. 40
Sheep,	head	....	1 62 .. 3 25	1 00 .. 2 87	....
Cows and Calves,		39 00 .. 45 00	25 00 .. 37 00	30 00 .. 40 00	30 00 .. 40 00

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